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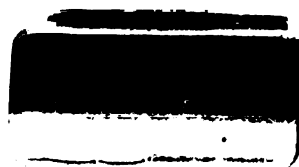
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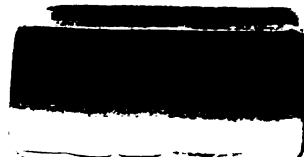
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STATE OF NEW YORK *Engineering Surveyor*

SUPPLEMENT

TO THE

ANNUAL REPORT

OF THE

State Engineer and Surveyor

For the Year Ended June 30, 1919



ALBANY
J. B. LYON COMPANY, PRINTERS
1920

REPORT
ON
HYDRAULIC DATA
1919
DEPARTMENT OF STATE ENGINEER AND
SURVEYOR
COMPRISING THE TWENTIETH ANNUAL REPORT ON
STREAM GAGING

JACOB LABISHNER,
Junior Assistant Engineer

[3]

631071

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REPORT ON STREAM GAGING FOR 1919

HON. FRANK M. WILLIAMS, *State Engineer and Surveyor*:

Sir.— It is my privilege to present herewith the report containing the results of the hydraulic work of the Department of State Engineer and Surveyor for the fiscal year ended June 30, 1919.

This report contains hydraulic and climatological data obtained during that period and available on the date submitted, as follows: Observations of water-surface elevations, records of the discharge of streams and precipitation in the Barge canal zone, collected by this Department; gaging records of streams throughout the state, furnished by the United States Geological Survey in coöperation either with this Department or with the New York State Conservation Commission; stream discharge and precipitation, mainly in the Catskill watersheds, supplied by the Board of Water Supply of the city of New York; United States Weather Bureau records, and other stream gagings furnished by corporations or individuals. Credit for same, where due, is given in connection with the several station records. The aim of this report has been to publish not simply data secured by this Department but all available stream flow data in the state during the year in one volume for the convenience of the public. This comprehensive treatment does not apply, however, to rainfall records.

Keeping step with the economical procedure of the Department, a score of gages was discontinued at their respective stations during the year. Many have been reestablished and the others will be, at or near locks (practically their old locations), to be read by employees of the Department of Public Works as part of their daily tasks, thereby obviating the necessity of paid observers.

The first appearance of newly established and operative gages includes:

No. 401, Seneca river above lock No. 1, near Cayuga.

No. 402, Seneca river below lock No. 1, near Cayuga.

No. 403, Barge canal above lock No. 25, at May's Point.

- No. 404, Barge canal below lock No. 25, at May's Point.
- No. 405, Oneida river above lock No. 23, near Brewerton.
- No. 406, Oneida river below lock No. 23, near Brewerton.
- No. 407, Barge canal above lock No. 20, near Whitesboro.
- No. 408, Barge canal below lock No. 20, near Whitesboro.
- No. 501, Canandaigua outlet above retention dam at Lyons.
- No. 502, Clyde river below lock No. 27, at Lyons.
- No. 503, Erie canal below lock No. 34, at Lockport.
- No. 504, Erie canal above lock No. 35, at Lockport.

A new precipitation station has been established at Linden.

The standard types of gages and bench-marks adopted by this Department are shown on the accompanying illustration and also in the book of "Instructions Regarding Stream Gages," published by the Department in pamphlet form. Type A and Type B gages in the station descriptions are those shown on this illustration.

Gages located at points convenient to Barge canal locks, dams or other structures, where employees of the Department of Public Works are stationed, are read by these men.

The publication of gage heights in connection with discharge tables furnished by the United States Geological Survey has been discontinued, except for stations on streams tributary to the Barge canal system.

Stream measurement work for the state of New York is done in two ways: First, actually by the Department of the State Engineer and Surveyor in the Barge canal zone; second, throughout the remainder of the state by the United States Geological Survey under Mr. C. C. Covert, District Engineer, funds for which work during the fiscal year ended June 30, 1919, were supplied as follows: By the Department of the State Engineer and Surveyor, \$2,500; New York State Conservation Commission, \$10,000; United States Geological Survey, \$4,000.



STANDARD VERTICAL STAFF GAGE, STATE ENGINEER'S DEPARTMENT

View of a Type A gage. Method of erection in two sections, where low-water gage cannot be extended for high-water readings. Bench-marks are seen in the walls at elevations 52.0 and 59.0. Type B gage differs only in manner of attaching, being set at right angles to face of wall.

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SCOPE

This report contains records from 189 stream gaging stations, 66 discharge stations, 10 of which show no elevations of water-surface and hence are not included in total for stream gaging, and 62 precipitation stations, maintained as shown below:

MAINTAINED BY	Stream stations	Discharge records	Precipitation stations
	No.	No.	No.
Department of State Engineer.....	128	5	13
U. S. Geological Survey with Department of State Engineer.....	17	17	2
U. S. Geological Survey with State Conservation Commission.....	37	36	.....
Board of Water Supply of New York City.....	.....	4	32
U. S. Weather Bureau with Department of State Engineer.....	.....	.....	10
Miscellaneous.....	7	4	5
Totals.....	189	66	62

Gages maintained by this Department to determine water-surface elevations are in general read to the nearest tenth foot with only occasional half-tenth foot readings (there are a few gages read in inches) and the hundredths of feet appearing in the tables of water-surface elevations are due to the elevations of the zero of the gage and should not be understood to indicate readings to hundredths of feet. The closeness to which readings are made will be evident upon an inspection of each table.

In a report of this kind, where the accuracy of the data from which the tables and computations are made depends largely on the care of the observers at the various stations and on natural conditions affecting stream flow, apparent inconsistencies will be found, but it is believed that the observers are in general faithful in the performance of their duties and that such errors as may occur do not seriously impair the value of the records.

For an explanation of the data you are referred to those sections of the report of Mr. C. C. Covert, District Engineer, United States Geological Survey, headed "Explanation of Data," and "Accuracy and Reliability of Data" (pp. 14-17), which cover the same ground and render a repetition here needless.

I wish to acknowledge the uniform courtesy and valuable assistance I have received from Mr. Covert and his assistants in connection with this work. Credit for records furnished is also due

the Department of Public Works, Mr. John D. Myton, Assistant Engineer for Northern New York, United States Engineer Department, Mr. George T. Todd, Meteorologist, United States Weather Bureau, Mr. J. Waldo Smith, Chief Engineer, Board of Water Supply of New York City and several other individuals and corporations.

Mr. Covert's report of the work of the United States Geological Survey in coöperation with the State of New York, a statement defining certain hydraulic terms used, a table of convenient equivalents, the hydraulic data and the climatological data are attached hereto in the order named.

Respectfully submitted,

JACOB LABISHINER,

Junior Assistant Engineer.

March 25, 1920.

REPORT OF UNITED STATES GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

ALBANY, N. Y., *February* 16, 1920.

HON. FRANK M. WILLIAMS, *State Engineer and Surveyor,*
Albany, N. Y.:

Dear Sir.—Transmitted herewith is a report on the hydrographic work carried on by the U. S. Geological Survey in coöperation with the State of New York for the fiscal year ended June 30, 1919.

The work has been done in coöperation with your Department and with the Division of Inland Waters of the Conservation Commission. Mr. N. C. Grover, Chief Hydraulic Engineer, and Mr. John C. Hoyt, Engineer in charge of the Division of Waters for the Geological Survey have had general supervision.

The accompanying report has been prepared under my direction by O. W. Hartwell, Assistant Engineer, assisted by A. H. Davison, Max H. Carson, J. Wendell Moulton, B. F. Howe, Otto Lauterhahn and Gertrude E. Shaw.

Acknowledgments are due engineers of your Department and of the Division of Waters of the Conservation Commission for assistance rendered in field and office.

Very truly yours,

C. C. COVERT,

District Engineer.

REPORT ON HYDROGRAPHIC INVESTIGATIONS CARRIED ON BY THE
UNITED STATES GEOLOGICAL SURVEY IN COÖPERATION
WITH THE STATE OF NEW YORK CONSERVATION
COMMISSION AND STATE ENGINEER
AND SURVEYOR

By C. C. COVERT, *District Engineer*

GENERAL STATEMENT

With practically no interruptions because of ice, extreme floods or very low flows, the records for the fiscal year ended with June, 1919, form a marked contrast with any corresponding year of record. Only in two or three cases was there ice obstruction and this condition lasted for a period of but two or three weeks.

SCOPE OF WORK

There were maintained during the year 59 stations. Estimates of discharge are published for 51 stations, giving a total of 604 months' records, or an average of 11.8 months per station per year. There were 322 discharge measurements made, or an average of 5.5 measurements per station of 12 months' records. The total cost per station of 12 months' records was \$313.80, as against \$313.99 for the previous year.

FINANCIAL STATEMENT

Appropriations.

New York State Conservation Commission.....	\$10,000 00
State Engineer and Surveyor	2,500 00
United States Geological Survey.....	4,000 00

Expenditures.

New York State Conservation Commission.....	\$8,630 31
State Engineer and Surveyor	2,377 93
United States Geological Survey.....	4,108 00
Outside contributions	635 26

Principal items of cost.

Observers' pay	\$2,137 95
Operation and maintenance	4,314 92
Construction	337 90
Office work	4,907 87
Top cost	4,052 86

GAGING STATIONS

Five new stations were established:

Tioga river near Erwins.
 Cohocton river near Savona.
 Cohocton river near Campbell.
 Mud creek near Savona.
 West Canada creek near Hinckley.

In addition to the above mentioned stations, some data are available from work on the Barge canal. Because of the rather incomplete stage of this work, however, no attempt was made to publish in this report data other than the daily gage heights and discharge measurements.

The new stations established are due largely to coöperation from power people who are directly interested in the stations mentioned. The cost of installing the stations was borne almost entirely by the coöperating parties. The stations mentioned, records for which are being submitted herewith, are as follows:

Hudson river near Indian Lake.	East branch of Delaware river at Fish Eddy.
Hudson river at North Creek.	Delaware river at Port Jervis.
Hudson river at Thurman.	Beaver kill at Cooks Falls.
Hudson river at Spier Falls.	West branch of Delaware river at Hale Eddy.
Hudson river at Mechanicville.	Susquehanna river at Conklin.
Indian lake reservoir.	Chenango river at Chenango Forks.
Indian river near Indian Lake.	Chemung river at Chemung.
Schroon river at Riverbank.	Tioga river near Erwins.
Sacandaga river near Hope.	Cohocton river near Savona.
Sacandaga river near Hadley.	Cohocton river near Campbell.
Feeder canal at Glens Falls.	Mud creek at Savona.
Hoosic river near Eagle Bridge.	Allegheny river at Red House.
Mohawk river at Vischer Ferry dam.	Cattaraugus creek at Versailles.
Mohawk river at Crescent dam.	Little Tonawanda creek at Linden.
West Canada creek at Hinckley.	Genesee river at Scio.
Nine-Mile feeder near Holland Patent.	Genesee river at St. Helena.
Miscellaneous measurements in Hudson river drainage basin.	

Genesee river at Jones bridge.	Black River canal, flowing south, near Boonville.
Canaseraga creek near Dansville.	Moose river at Moose River.
Canaseraga creek near Cumminsville.	Middle branch of Moose river at Old Forge.
Canaseraga creek near Groveland Station.	Beaver river at State dam.
Canaseraga creek at Shakers Crossing.	Oswegatchie river near Heuvelton.
Keshequa creek, Craig Colony, near Sonyea.	East branch of Oswegatchie river at Newton Falls.
Barge canal near South Greece.	West branch of Oswegatchie river at Harrisville.
Barge canal at Lock 32.	Raquette river at Piercesfield.
Canadice outlet near Hemlock.	St. Regis river at Brasher Center.
Owasco outlet near Auburn.	Richelieu river at Fort Montgomery.
Miscellaneous measurements in Lake Ontario drainage basin.	Lake George at Rogers Rock.
Black river near Boonville.	Ausable river at Ausable Forks.
Black river at Black River.	West branch of Ausable river near Newman.
Forestport feeder near Boonville.	Saranac river near Plattsburg.

EXPLANATION OF DATA

The stations discussed are considered in order downstream. Records for all stations on the main river from its source to its mouth are presented first and records for its tributaries in regular order, from source to mouth, follow, all records for each tributary drainage basin being given before those of the next basin below.

For each regular current-meter gaging station the following data, so far as available, are given: Description of station, list of discharge measurements, table of daily discharge, table of monthly and yearly discharge and run-off. For stations located on streams tributary to the Barge canal a table of daily gage heights is also given.

In addition to statements regarding the location and installation of current-meter stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such factors as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The discharge-measurement table gives the results of the discharge measurements made during the year, including the date, name of hydrographer, gage height in feet, and discharge in second-feet.

Where published, the table of daily gage heights records the fluctuations of the stage of the river as found from the mean of the gage readings taken each day. At stations not equipped with recording instruments, the gage is usually read by the observer in the morning and in the evening. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams, or by backwater from obstructions, are published as recorded, with suitable foot-notes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general, the zero is located somewhat below the lowest known flow, so that the readings shall not have a negative value.

The discharge measurements and gage heights are the base data from which rating tables, daily-discharge tables and monthly-discharge tables are computed.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. Rating tables are not published in this report, but if desired for the purpose of verifying the published results they can be made from the daily gage heights and daily discharge as follows:

First, plot the discharge measurements for the current and earlier years on cross-section paper with gage heights in feet as ordinates and discharge in second-feet as abscissas. Then, tabulate a number of gage heights taken from the daily gage-height table* for the complete range of stage given and the corresponding discharge for the days selected from the daily-discharge table, and plot the values on cross-section paper. The last points plotted will define the rating curve used and will lie among the plotted discharge measurements. After drawing the rating curve, a table can be developed by scaling off the discharge in second-feet for each tenth foot of gage height. These values should be so adjusted that the first differences shall always be increasing or constant, except for known conditions of backwater.

* Where gage heights are not published, copies can be had upon application to the State Engineer or United States Geological Survey, Albany, N. Y.

The table of daily discharge gives the discharge in second-feet corresponding to the observed gage heights as determined from the rating tables.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the assumed mean for the day, it does not indicate correctly the stage when the water-surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum," the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns are based.

The base data presented in this report, unless otherwise stated in description of station, have been collected by the methods commonly used at current-meter gaging stations and described in standard text books.

ACCURACY AND RELIABILITY OF DATA

The accuracy of stream-flow data depends primarily on the natural conditions at the gaging station and on the methods and care with which the data are collected. Errors of the first group depend upon the degree of permanency of channel and of permanency of the relation between discharge and stage. Errors of the second class are due, first, to errors in observation of stage; second, to errors in measurements of flow; and third, to errors due to misinterpretation of stage and flow data.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to errors which result from including in the measured drainage area some noncontributing districts or omitting estimates of water diverted for municipal supplies or other purposes, and they should, therefore, be considered as only approximate, particularly for winter periods or low water. For these errors it is as a rule not feasible to make adequate correction.

The table of monthly discharge is so arranged as to give a general idea of the flow at the station, but should be used only for preliminary estimates. The computations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined.

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published, and the engineer who makes use of the figures presented in this report should familiarize himself with the conditions under which they were collected before attempting to draw conclusions for periods other than those covered by the data.

HYDRAULIC DATA

DEFINITION OF TERMS

Barge canal datum is sea-level (mean tide) at Governor's Island, which has been taken as 14.73 feet below the "Grist-mill" bench-mark in Greenbush (now Rensselaer). This bench-mark was established by the United States Coast and Geodetic Survey in 1857 and is described as a cross cut in the face of the cellar wall of an old grist-mill at Greenbush, opposite Albany. This structure was replaced about 1905 by an office building on the same foundation and is now owned by the Cornell Steamboat Company. The elevations given herein, unless otherwise noted, are feet above Barge canal datum, indicated as (B. C. datum), which is the datum used in the construction of the Barge canal by the State of New York.

The United States Engineer Department uses in its work on the Hudson river and Lake Champlain two datum planes. All elevations south, or downstream from and exclusive of the new Federal dam at Troy (1,400 feet north of the old State dam) are referred to an assumed plane of **lowest low water** in the Hudson river at this locality, indicated as (L. L. W.), which is 2.0 feet below the mean sea-level at Sandy Hook, N. J., or 15.863 feet below the elevation of "Greenbush" bench-mark as published in the Annual Report of the United States Coast and Geodetic Survey for 1903, Appendix No. 3. This plane of lowest low water (L. L. W.) is 1.13 feet below Barge canal datum. To reduce lowest low water (L. L. W.) elevations to Barge canal datum (B. C. datum), subtract 1.13 feet.

All elevations used by the United States Engineer Department in connection with the new Federal dam at Troy and north thereof are referred to mean sea-level at Sandy Hook, N. J., indicated as (M. S. L.). Mean sea-level (M. S. L.) at Albany is 0.87 foot

above Barge canal datum (B. C. datum), but on Lake Champlain mean sea-level (M. S. L.) is only 0.81 foot above Barge canal datum (B. C. datum).

Elevations (M. S. L.) at Albany + 0.87 foot = Elevations (B. C. datum).

Elevations (M. S. L.) on Lake Champlain + 0.81 foot = Elevations (B. C. datum).

The volume of water flowing in a stream — the “run-off” or “discharge” — is expressed in various terms, each of which has become associated more or less definitely with a certain class of work. These terms may be divided into two groups — (1) those which represent a rate of flow, as “second-feet,” “gallons per minute,” “gallons per 24 hours,” “miner’s inches” and “run-off in second-feet per square mile,” and (2) those which represent the actual quantity of water, as “run-off in depth in inches,” “million gallons,” “cubic feet,” and “acre-feet.” The units used in this report are “second-feet,” “second-feet per square mile,” “run-off depth in inches” and “million gallons.” They may be defined as follows:

“Second-foot” is an abbreviation for cubic foot per second and represents the rate of discharge of water flowing in a channel one square foot in cross-section at a rate of one foot per second. It is generally adopted as the fundamental unit in the measurement of flowing water and is the “natural” unit, as the foot and second are the units used in making the physical determinations. Other units may be computed from this by the use of factors given in the table of equivalents.

“Second-feet per square mile” is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

“Run-off depth in inches” is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed over the surface. It is used for comparing run-off with rainfall, which is usually expressed as depth in inches.

CONVENIENT EQUIVALENTS

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area

Sec.-ft. per Sq. Mi.	DEPTH IN INCHES FOR PERIODS INDICATED							Sec.-ft per sq. mi.
	1 day	28 days	29 days	30 days	31 days	365 days	366 days	
1.....	0.037190	1.041322	1.076512	1.115702	1.152893	13.574380	13.611570	1
2.....	.074380	2.082645	2.157025	2.231405	2.305785	27.148760	27.223140	2
3.....	.111570	3.123967	3.235537	3.347107	3.458676	40.723140	40.834711	3
4.....	.148760	4.165289	4.314050	4.462810	4.611570	54.297521	54.446281	4
5.....	.185950	5.206612	5.392562	5.578512	5.764463	67.871901	68.057851	5
6.....	.223140	6.247934	6.471074	6.694215	6.917356	81.446281	81.669421	6
7.....	.260331	7.289256	7.549587	7.809917	8.070248	95.020661	95.280992	7
8.....	.297521	8.330579	8.628099	8.925620	9.223140	108.595041	108.892562	8
9.....	.334711	9.371901	9.706612	10.041322	10.376033	122.169421	122.504132	9

NOTE.— For partial month, multiply the values for one day by the number of days.

1 second-foot equals 7.49 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year covers 1 square mile 1.131 feet, or 13.572 inches, deep.

1 second-foot for one year equals 31,536,000 cubic feet.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for 1 day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

1,000,000 United States gallons per day equals 1.55 second-feet.

100 United States gallons per minute equals 0.223 second-foot.

1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 inch deep on 1 square mile equals 0.0737 second-foot per year.

- 1 foot equals 0.3048 meter.
- 1 mile equals 1.60935 kilometers.
- 1 mile equals 5,280 feet.
- 1 acre equals 0.4047 hectare.
- 1 acre equals 43,560 square feet.
- 1 acre equals 209 feet square, nearly.
- 1 square mile equals 2.59 square kilometers.
- 1 cubic foot equals 0.0283 cubic meter.
- 1 cubic foot of water weighs 62.5 pounds.
- 1 cubic meter per minute equals 0.5886 second-foot.
- 1 horse-power equals 550 foot-pounds per second.
- 1 horse-power equals 76.0 kilogram-meters per second.
- 1 horse-power equals 746 watts.
- 1 horse-power equals 1 second-foot falling 8.80 feet.
- $1\frac{1}{3}$ horse-power equals about 1 kilowatt.

To calculate water-power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11} = \text{net horse-}$
power on water-wheel realizing 80 per cent of theoretical power.

ST. LAWRENCE RIVER DRAINAGE

GENERAL FEATURES

The surface waters of an area of 565,000 square miles in extent pass to the ocean by way of St. Lawrence river. In form this area is an irregular parallelogram extending southwestward for about 900 miles with a fairly uniform breadth of 250 miles. The Great Lakes, into which the river expands, have a water-surface of 95,600 square miles, leaving for the land surface drained by the river about 470,000 square miles. More than eight-tenths of this area belongs to Canada. The remainder constitutes a part of the United States. With the exception of about 50,000 square miles (including the whole of the Gaspe Peninsula) in the eastern part of the Province, the Canadian portion lies wholly on the north side of the river. The only part of the United States lying north of the river is at the west end of Lake Superior.

At its mouth the river and its tributaries are drowned, so that the salt water of the ocean enters to form the broad bay of St. Lawrence, with its irregular margin, and even beyond the bay there is indication of a river valley carved in the continental shelf completely covered by the ocean waters. Upstream from the bay of St. Lawrence the water area narrows and the water freshens, though the tide rises nearly as far as Montreal, where the St. Lawrence is a very broad river with gentle current. Just above Montreal the river becomes a series of violent rapids, and from this point upstream it consists of stretches of quiet water separated by rapids. At the outlet of Lake Ontario the river passes through a maze of islands, beyond which is Lake Ontario — the lowest of the five Great Lakes.

The lakes are connected by broad rivers and straits, which in places are navigable, are elsewhere interrupted by rapids and in one place are broken by one of the great falls of the world — Niagara. To the entire area above the mouth of Lake Ontario no large river is tributary. In places the divide runs close to the lakes and is nowhere far from them.

In the northwestern part of the state of New York, between Niagara and St. Lawrence rivers, is an area aggregating 12,400 square miles drained by streams which flow into Lake Ontario. The divide which controls this drainage is very irregular. Extending to the south and southeast from Fort Niagara, it passes around the headwaters of the Genesee a short distance into Pennsylvania; thence reëntering New York it turns southward and eastward taking in the finger lake region, turns to the north, encircles the sources of Black river, turns again to the west and descends to the lake. The country thus included is level or gently undulating in the counties bordering the lake, but farther south it becomes more rolling and a series of ridges, gradually increasing in height, stretch down between Cayuga and Seneca and their companion lakes, finally becoming merged with the elevated, broken country forming the principal divide whose abrupt slopes reach altitudes of 2,000 to 2,500 feet above the headwaters of the Genesee. The easterly or Black river lobe of the drainage basin receives the run-off from the southwestern slope of the Adirondack mountains—largely a rugged and forest-covered area receiving heavy precipitation, especially in the winter. The principal streams of the area are Genesee, Oswego (formed by the union of Seneca and Oneida rivers, which drain the chain of lakes in central New York), Salmon and Black rivers. A small area in the western part of the state is drained by Lake Erie.

St. Lawrence river receives the flow of a number of New York streams having their sources in a northerly slope of the Adirondacks and fed by the numerous lakes with which the region is dotted. Some of these rivers, as the Grass, Raquette and St. Regis, lie entirely within the United States; others, notably Salmon, Trout, Chateaugay and English rivers, cross the international boundary and flow northward into the St. Lawrence in Canada, as does also Richelieu river, the outlet of Lake Champlain. The following table gives a list of the principal tributaries of the St Lawrence in the United States, with the areas drained by them, determined chiefly from Bien's Atlas of the state of New York.

Drainage areas of ST. LAWRENCE RIVER TRIBUTARIES in the United States

	Square miles		Square miles
Oswegatchie river.....	1,609	Salmon river <i>a</i>	273
Grass river.....	637	Trout river <i>b</i>	129
Raquette river.....	1,219	Chateaugay river <i>b</i>	199
St. Regis river.....	910	English river <i>b</i>	53
Little Salmon river <i>a</i>	103	Lake Champlain <i>c</i>	7,867

a Above junction near international boundary. *b* At New York State line. *c* Above outlet.

The St. Lawrence drains, through Lake Champlain, an area of nearly 4,560 square miles in the state of Vermont. This drainage is practically all from Missisquoi, Lamoille and Winooski rivers and Otto creek. Clyde, Barton and Black rivers, in northern Vermont, are tributary to St. Lawrence river through Lake Memphremagog and St. Francis river.

NIAGARA RIVER DRAINAGE

GENERAL FEATURES

Niagara river connects Lakes Erie and Ontario. It receives the drainage from Tonawanda creek and adjacent smaller areas in New York.

NIAGARA RIVER

NIAGARA RIVER: AT TONAWANDA CREEK, TONAWANDA.

Gage No. 221

This station, established by this Department, January 23, 1905, is located on Tonawanda creek about 400 feet above its junction with Niagara river and 1,100 feet below the State dam, at the New York Central railroad drawbridge. A staff gage was used until April 8, 1908, when a Friez automatic gage, making a seven-day graph, was installed just below the bridge and has been used since, being checked by weekly readings on the staff gage. The automatic gage has a range of eight feet, between elevations 565.0 and 573.0.

On December 1, 1916, a standard Type A gage, No. 221, in two sections, having a range of eight feet, was erected on the back of the easterly abutment of the drawbridge, to replace the old gage, the lower section reading from 563.0 to 567.0 and the upper section from 567.0 to 571.0. A standard bench-mark plug was set in the rear face of the abutment close to the gage at elevation 571.0 (B. C. datum). Mean daily water-surface has been taken from the graph to the nearest tenth of a foot.

Daily elevation of water-surface (B. C. datum) of NIAGARA RIVER AT TONAWANDA CREEK, TONAWANDA, for the year ended June 30, 1919. L. H. Bartows, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	567.0	567.1	567.2	567.0	567.3	c	567.3	567.0	s	567.3	567.5	567.8
2.....	567.3	567.2	567.0	567.2	567.3	c	p	566.9	566.9	567.5	568.3	567.8
3.....	567.0	566.8	567.2	567.1	567.1	c	p	566.8	566.8	567.4	567.8	567.8
4.....	567.0	567.0	566.7	567.0	567.0	c	p	567.2	566.9	s	567.5	567.8
5.....	567.0	567.1	567.0	567.3	566.7	c	p	567.5	566.8	s	567.9	567.8
6.....	567.1	567.1	567.1	567.2	566.8	c	p	567.2	566.8	567.3	567.8	567.8
7.....	567.1	567.3	567.2	566.7	567.0	c	p	567.2	566.8	567.3	567.8	s
8.....	567.1	567.3	567.2	566.9	566.8	567.1	p	567.1	566.8	567.2	567.7	568.2
9.....	567.3	567.3	567.2	567.0	567.1	566.9	p	567.0	567.5	567.1	567.3	568.2
10.....	567.2	567.2	567.0	567.1	567.2	565.9	p	566.9	567.6	567.2	567.2	568.2
11.....	567.1	567.2	566.9	567.0	566.8	566.9	p	566.9	567.5	567.5	567.8	568.1
12.....	567.0	567.2	567.3	567.1	566.8	567.2	566.9	566.8	567.4	567.6	568.0	568.0
13.....	567.0	567.3	567.6	p	567.2	566.7	p	566.6	p	567.6	568.0	s
14.....	567.0	567.3	567.3	p	567.0	n	p	s	p	567.4	567.9	s
15.....	567.0	567.2	567.3	p	566.9	567.1	p	s	566.7	566.9	567.9	568.2
16.....	567.0	567.2	567.1	p	566.8	566.9	p	567.3	567.1	567.3	567.8	568.2
17.....	567.0	566.9	567.0	p	566.7	566.6	p	567.0	567.2	567.8	568.1	568.1
18.....	567.0	566.8	567.1	p	567.3	566.7	p	567.1	568.0	567.8	568.2	568.0
19.....	567.0	566.6	567.6	p	567.5	566.8	567.0	567.1	567.4	567.6	567.9	568.1
20.....	567.1	566.9	567.3	567.3	567.0	566.9	566.9	566.7	567.3	567.2	567.4	568.0
21.....	567.0	567.1	567.3	567.1	567.0	566.9	566.8	567.2	567.3	567.6	567.9	s
22.....	567.0	567.1	567.3	566.8	567.0	567.0	566.9	566.6	567.1	567.5	568.1	567.8
23.....	567.0	567.1	567.4	566.8	567.2	567.3	567.1	567.7	567.3	567.5	s	567.9
24.....	567.0	567.1	567.1	566.8	567.7	566.4	567.5	567.0	567.3	568.1	568.1	567.9
25.....	567.0	567.1	567.0	567.0	567.6	567.8	567.0	566.8	567.2	568.2	568.0	567.9
26.....	567.0	567.2	567.3	566.8	566.8	c	567.4	567.6	567.2	568.1	569.0	s
27.....	567.2	566.8	567.6	566.8	567.1	c	567.3	567.3	567.6	567.8	567.8	s
28.....	567.1	567.0	567.7	567.1	566.8	c	567.1	s	567.7	567.6	567.7	s
29.....	567.2	567.3	567.1	567.0	566.8	567.4	567.4	.....	567.6	567.6	567.8	567.5
30.....	567.2	567.0	567.0	567.0	568.0	567.1	567.4	.....	567.4	567.4	567.8	567.6
31.....	566.9	567.2	.....	567.1	.....	567.0	567.4	.....	567.3	.....	567.8	.....

p Pen failed to record properly; float stuck. c Chain on gage caught. n Not accurate enough to record. s Clock stopped.

CATTARAUGUS CREEK

DESCRIPTION

Cattaraugus creek rises in the southwestern part of Wyoming county and flows in a westerly direction, entering Lake Erie about 25 miles southwest of Buffalo, on the boundary line between Erie and Chautauqua counties. The stream is about 55 miles long and drains an area of approximately 560 square miles above the mouth. A large portion of its course forms the boundary between Erie and Chautauqua counties. Its headwaters rise at an elevation of between 1,900 and 2,000 feet. The drainage basin is hilly, fairly well timbered and rather narrow. There are few tributary streams, those of most importance entering the river from the south.

South branch of Cattaraugus creek, which is the largest tributary, enters at a point about two miles above Gowanda. There is a dam at Gowanda, which is used for developing electric power and also for running a local grist-mill.

CATTARAUGUS CREEK AT VERSAILLES

Location.—At the three-span highway bridge in the village of Versailles, Cattaraugus county, $2\frac{1}{4}$ miles above the mouth of Clear creek, about 6 miles below Gowanda and about 8 miles above the mouth of the stream.

Drainage area.—467 square miles. (Measured on post-route map.)

Records available.—September 23, 1910, to June 30, 1919.

Gage.—Chain, on upstream side of right span of bridge; read by Charles Wilson.

Discharge measurements.—Made from the downstream side of bridge or by wading.

Channel and control.—Rock and gravel; shifting.

Extremes of discharge.—Current year: Maximum stage recorded, 9.5 feet at 7:15 p. m., May 10; discharge, 14,200 second-feet. Minimum stage recorded, 0.35 foot several times in August, 1918; discharge, 50 second-feet.

1910-1919: Maximum open-water stage recorded, 11.6 feet at 5:40 p. m., March 25, 1918; discharge, about 30,000 second-feet. Minimum stage recorded, 4.35 feet several times in August, 1918; discharge, about 49 second-feet.

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation not permanent. Affected by ice during large portion of the period from December to March, inclusive. Gage read to half-tenths twice daily. Daily discharge throughout the year ascertained by indirect method of applying mean daily effective gage heights to rating table. Effective gage heights determined from discharge measurements. Results fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

GAGING OF STREAMS: NIAGARA RIVER DRAINAGE 27

Discharge measurements of CATTARAUGUS CREEK AT VERBAILLES, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 22.....	E. D. Burchard.....	4.45	78.1
Aug. 22.....	E. D. Burchard.....	4.50	78.4
Aug. 22.....	E. D. Burchard.....	4.60	117
1919			
April 2.....	J. W. Moulton.....	5.05	365
April 17.....	M. H. Carson.....	5.90	1,580
May 17.....	J. W. Moulton.....	6.24	2,460
June 18.....	J. W. Moulton.....	4.94	208

Daily gage height, in feet, of CATTARAUGUS CREEK AT VERBAILLES, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	4.85	4.75	4.60	4.85	5.8	5.08	6.4	5.00	6.7	5.20	5.45	5.20
2.....	4.82	4.68	4.50	4.80	6.0	5.00	6.35	4.88	5.55	5.04	5.5	5.12
3.....	4.75	4.65	4.50	5.35	5.8	5.08	5.5	5.00	5.40	5.04	5.38	5.12
4.....	4.68	4.65	4.55	5.02	5.85	5.15	5.20	5.05	5.38	5.15	5.35	5.16
5.....	4.69	4.70	4.70	4.92	5.9	5.10	5.6	5.05	5.56	5.22	5.7	5.20
6.....	4.60	4.62	4.95	5.18	5.45	5.12	5.6	4.92	5.45	5.15	5.45	5.10
7.....	4.62	4.50	4.72	5.5	5.30	5.00	5.7	5.08	5.28	5.32	5.38	5.12
8.....	4.56	4.55	4.58	5.15	5.25	6.0	5.75	5.05	5.20	5.25	5.35	5.15
9.....	4.68	4.62	4.58	5.02	5.10	6.25	5.7	5.00	6.4	5.65	5.42	5.10
10.....	4.80	4.65	4.42	4.92	5.12	5.6	5.40	4.98	6.0	6.2	7.2	5.05
11.....	4.92	4.65	4.55	4.88	5.08	5.40	5.30	4.98	5.7	7.0	7.6	5.05
12.....	4.78	4.75	4.50	4.88	5.00	5.45	5.10	5.08	5.45	6.5	6.3	5.00
13.....	4.70	4.65	4.65	4.95	5.00	5.35	4.80	5.05	5.65	6.0	5.9	5.00
14.....	4.68	4.60	4.75	4.90	4.95	5.9	5.6	5.38	5.20	5.75	5.65	5.00
15.....	4.55	4.48	4.68	4.90	4.90	6.4	5.75	5.85	5.22	5.6	5.48	5.00
16.....	4.60	4.39	4.72	4.85	4.90	5.7	5.6	5.30	5.6	6.05	5.40	4.95
17.....	4.65	4.42	5.12	4.82	4.95	5.42	5.7	5.15	6.25	5.85	6.3	4.92
18.....	4.60	4.46	5.02	4.78	5.05	5.25	5.55	5.10	6.3	5.7	5.8	4.92
19.....	4.58	4.42	4.98	4.75	5.35	5.15	5.20	5.00	5.75	5.55	5.46	4.95
20.....	4.55	4.45	5.25	4.80	5.35	5.08	5.18	4.96	5.48	5.40	5.46	4.98
21.....	4.55	4.45	5.10	5.6	5.25	5.05	5.22	5.10	5.40	5.6	6.6	4.95
22.....	4.50	4.48	5.05	5.15	5.30	5.22	5.48	5.08	5.32	5.35	7.6	4.91
23.....	4.52	4.58	5.02	5.20	5.18	5.5	5.7	5.75	5.20	5.25	6.45	4.90
24.....	4.52	4.48	5.00	4.92	5.05	5.32	6.0	5.35	5.20	6.0	6.0	4.90
25.....	5.00	4.45	5.15	4.85	5.00	6.7	5.48	5.38	5.15	5.5	5.85	4.92
26.....	4.70	4.48	4.95	4.95	4.95	5.45	5.40	5.38	5.10	5.48	5.6	5.26
27.....	4.62	4.42	5.12	5.02	4.92	5.28	5.25	5.12	5.15	5.85	5.48	5.45
28.....	4.80	4.42	5.18	4.98	5.00	5.18	5.15	5.15	5.30	6.0	5.35	5.12
29.....	4.70	4.52	4.98	5.22	5.45	5.12	5.12	.....	5.12	6.0	5.3	4.98
30.....	5.48	4.70	4.88	5.25	5.35	5.15	5.03	.....	5.12	5.6	5.2	4.95
31.....	4.90	4.50	.....	6.45	.....	5.20	5.02	.....	5.12	.....	5.2	.....

Daily discharge, in second-feet, of CATTARAUGUS CREEK AT VERSAILLES, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	240	180	120	240	1,200	380	2,400	320	3,200	500	900	400
2.....	220	150	85	200	1,600	320	2,400	240	900	380	950	340
3.....	180	140	85	650	1,200	380	850	320	700	380	800	340
4.....	150	140	100	340	1,300	460	500	380	700	480	750	320
5.....	150	160	160	280	1,400	400	400	380	900	500	1,200	400
6.....	120	130	300	480	750	440	380	280	750	460	900	320
7.....	130	85	170	850	900	320	400	380	550	600	800	340
8.....	110	100	110	460	550	1,500	460	380	500	550	750	380
9.....	140	130	110	340	400	2,000	400	320	2,400	1,000	850	320
10.....	220	150	65	280	440	950	300	320	1,500	2,000	5,000	280
11.....	280	140	100	240	380	700	280	320	1,100	4,400	7,000	280
12.....	200	180	85	240	320	750	200	380	1,750	3,000	2,600	240
13.....	160	140	140	320	320	650	200	380	1,000	1,500	1,700	240
14.....	150	120	180	260	300	1,400	950	700	500	1,300	1,300	240
15.....	100	80	150	260	260	2,400	1,200	1,300	500	1,000	1,000	240
16.....	120	55	170	240	280	1,000	1,000	600	950	1,900	900	220
17.....	140	65	440	220	300	750	1,100	460	2,000	1,500	2,600	200
18.....	120	80	360	180	380	550	600	400	2,200	1,200	1,500	200
19.....	110	65	320	180	650	460	500	320	1,200	1,000	1,000	220
20.....	100	80	550	200	650	380	480	800	800	800	1,000	240
21.....	100	75	420	950	550	380	500	400	700	1,000	3,400	220
22.....	85	80	380	460	600	500	800	380	600	750	6,000	200
23.....	95	110	360	500	460	900	1,000	1,200	500	650	2,400	180
24.....	95	80	840	280	380	600	1,600	650	500	1,800	1,400	180
25.....	340	65	440	240	320	1,100	800	700	460	950	1,200	190
26.....	160	80	300	300	300	750	700	700	400	900	800	420
27.....	130	65	440	340	280	550	550	440	460	1,500	700	600
28.....	220	65	500	320	320	480	460	460	600	1,700	550	320
29.....	160	95	320	500	750	440	440	.....	440	1,700	500	220
30.....	800	160	260	550	700	460	380	.....	440	1,000	480	200
31.....	280	85	.....	2,600	.....	500	340	.....	440	.....	440	.....
Mean.....	181	107	252	436	598	737	737	479	924	1,220	1,660	283

Monthly discharge of CATTARAUGUS CREEK AT VERSAILLES, for the year ended June 30, 1919

[Drainage area, 467 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	800	85	181	0.388	0.45
August.....	180	55	107	0.229	0.26
September.....	550	65	252	0.540	0.60
October.....	2,600	180	436	0.934	1.08
November.....	1,600	260	598	1.28	1.43
December.....	2,400	320	737	1.58	1.82
January.....	2,400	200	737	1.58	1.82
February.....	1,300	240	479	1.03	1.07
March.....	3,200	400	924	1.98	2.28
April.....	4,400	360	1,220	2.61	2.91
May.....	7,000	440	1,660	3.55	4.09
June.....	600	180	283	0.606	0.70
The year.....	7,000	55	634	1.36	18.51

TONAWANDA CREEK

DESCRIPTION

Tonawanda creek rises in Wyoming county and flows northward into Genesee county. At Batavia it turns abruptly to the west

and continues in that direction until it reaches the Niagara river at Tonawanda. After passing out of Genesee county it forms the boundary between Niagara county and Erie county.

Tonawanda creek rises in a rather hilly country and, in the upper part of its basin, flows through a rather narrow valley. Its main tributary is Little Tonawanda creek, which flows into the stream from the right about 3 miles south of Batavia.

Between Pendleton and Tonawanda the creek and the Erie canal are coincident, the creek leaving the canal over the State dam at Tonawanda. Water for canal purposes is passed eastward in the canal from Tonawanda creek and Lake Erie.

ERIE CANAL AT CHANGE BRIDGE, PENDLETON

This station is located at change bridge over the Erie canal at its junction with Tonawanda creek about $\frac{1}{2}$ mile southwest of Pendleton. The gage is a staff secured to a pile under the old tow-path bridge. It is read once daily — at 5 P. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of ERIE CANAL AT CHANGE BRIDGE, PENDLETON, for the year ended June 30, 1919. Homer Snell, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	567.5	566.35	566.4	566.4	566.5	566.0	567.0	566.6	567.2	567.1	567.5	567.7
2.....	566.4	566.5	566.4	566.4	566.8	566.1	567.2	566.5	566.8	567.4	568.3	567.8
3.....	566.35	566.4	567.0	566.4	566.4	565.9	567.0	566.4	566.75	567.1	567.3	567.7
4.....	566.35	566.65	566.0	566.3	566.25	566.65	567.8	567.25	566.75	566.95	567.25	567.7
5.....	566.5	566.5	566.0	566.8	566.1	566.0	566.8	567.3	566.5	566.95	568.5	567.85
6.....	566.4	566.5	566.55	566.6	566.25	565.9	566.9	566.6	566.5	566.95	567.6	568.0
7.....	566.4	566.6	566.4	566.1	566.2	566.5	567.0	566.9	566.5	566.85	568.0	567.75
8.....	566.5	566.85	566.4	566.3	566.0	566.5	567.5	566.6	566.0	566.65	567.5	567.9
9.....	566.7	566.5	566.4	566.4	566.5	566.0	567.3	566.5	567.9	566.8	566.8	567.9
10.....	566.6	566.5	566.0	566.65	566.5	565.3	567.0	566.4	568.1	566.6	567.25	567.8
11.....	566.4	566.5	566.4	566.35	566.05	566.7	566.5	566.3	567.9	567.5	569.4	567.7
12.....	566.1	566.6	566.6	566.6	566.15	566.6	566.3	566.1	567.6	567.7	570.0	567.7
13.....	566.0	566.6	567.0	566.6	566.8	566.1	566.4	565.9	566.0	567.7	569.5	567.85
14.....	566.2	566.6	566.6	566.7	566.2	566.4	566.7	566.6	566.8	567.15	568.3	567.8
15.....	566.35	566.5	566.65	566.4	566.2	566.9	566.9	566.9	566.0	566.5	567.95	567.9
16.....	566.2	566.4	566.2	566.2	566.1	566.7	566.9	567.2	567.0	568.5	567.6	567.55
17.....	566.1	566.1	566.4	566.5	566.0	566.25	566.8	566.8	567.1	568.2	568.7	567.7
18.....	566.5	566.0	566.35	565.65	566.8	566.4	566.85	566.6	566.1	567.7	568.45	567.65
19.....	566.5	566.0	566.6	565.65	567.0	566.5	566.4	566.6	567.5	567.5	567.8	567.75
20.....	566.4	566.3	566.65	567.2	566.4	566.4	566.3	566.25	567.3	567.5	568.0	567.65
21.....	566.4	566.3	566.4	566.4	566.5	566.4	566.3	566.4	567.0	567.3	567.85	567.75
22.....	566.4	566.5	566.7	566.2	566.3	566.7	566.5	566.2	566.9	567.5	568.9	567.65
23.....	566.3	566.75	566.75	566.15	566.5	566.7	566.4	567.75	567.0	567.4	570.3	567.8
24.....	566.35	566.35	566.2	566.15	567.4	566.5	566.7	566.65	566.9	566.1	570.0	567.8
25.....	566.4	566.4	566.25	566.3	567.0	568.0	566.7	566.65	566.85	566.3	569.1	567.5
26.....	566.5	566.6	566.5	566.2	566.0	567.0	567.5	567.5	566.9	568.0	568.1	567.65
27.....	566.3	566.3	566.8	566.2	566.3	566.9	566.9	566.9	567.4	567.5	567.75	567.4
28.....	566.0	566.4	567.4	566.7	565.7	566.8	566.9	566.4	567.4	567.8	567.8	567.5
29.....	566.5	566.5	566.4	566.25	567.2	567.3	567.1	.....	567.3	567.7	567.85	567.5
30.....	566.3	566.35	566.1	566.2	567.25	566.7	567.1	.....	567.0	567.6	567.8	567.4
31.....	566.0	566.3	.....	566.7	.....	566.6	566.9	.....	566.85	.....	567.8	.....

LITTLE TONAWANDA CREEK

LITTLE TONAWANDA CREEK AT LINDEN

Location.—At the stone arch highway bridge in the village of Linden, Genesee county, about 3 miles above the junction with Tonawanda creek.

Drainage area.—22 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—July 8, 1912, to June 30, 1919.

Gage.—Vertical staff, on right upstream abutment of bridge. Lower 2 feet of enameled iron, graduated to hundredths of a foot; upper 4 feet of bronze graduated to half-tenths; read by C. L. Schenck and Thomas W. Mills.

Discharge measurements.—High-water measurements made from a cable 1,000 feet above gage; low-water measurements made by wading near gage.

Channel and control.—Channel of coarse gravel and boulders and is probably permanent between dates of shift.

Extremes of discharge.—Current year: Maximum stage recorded, 9.0 feet at 6 P. M., May 10; discharge 2,500 second-feet. Minimum stage recorded, -0.46 foot at 8 P. M., August 20, 1918; discharge, 0.8 second-foot.

1912-1919: Maximum stage recorded, 9.0 feet at 6 P. M., May 10, 1919; discharge, 2,500 second-feet. Minimum stage recorded, 0.18 foot, August 20 and 21, September 14 to 16 and October 8, 1913; discharge, 0.43 second-foot.

Accuracy.—Stage-discharge relation permanent between dates of shift. Rating curve fairly well defined. Gage read to hundredths of a foot twice daily.

Daily discharge ascertained by applying mean daily gage height to rating table. Results fairly good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

GAGING OF STREAMS: NIAGARA RIVER DRAINAGE 31

Discharge measurements of LITTLE TONAWANDA CREEK AT LINDEN, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 23.....	C. C. Covert.....	-0.39	0.70
Aug. 21.....	E. D. Burchard.....	-0.47	0.60
1919			
Jan. 23.....	E. D. Burchard.....	0.22	36.8
May 16.....	J. W. Moulton.....	0.13	35.6
June 17.....	J. W. Moulton.....	0.015	25.0
June 17.....	J. W. Moulton.....	0.005	25.7

Daily gage height, in feet, of LITTLE TONAWANDA CREEK AT LINDEN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	-0.26	-0.43	-0.45	-0.37	-0.02	-0.08	0.45	-0.14	1.25	-0.04	0.20	-0.16
2.....	-0.30	-0.44	-0.46	-0.36	-0.02	-0.14	0.32	-0.18	0.32	-0.04	0.12	-0.17
3.....	-0.34	-0.44	-0.47	-0.34	0.15	-0.17	0.02	-0.18	0.08	-0.08	0.04	-0.20
4.....	-0.35	-0.43	-0.47	-0.32	-0.06	-0.15	0.20	-0.16	0.16	-0.08	0.08	-0.21
5.....	-0.36	-0.42	-0.42	-0.33	-0.02	-0.16	0.14	-0.12	0.37	-0.08	0.58	-0.14
6.....	-0.38	-0.44	-0.43	-0.14	-0.10	0.04	0.12	a	0.24	-0.02	0.17	-0.02
7.....	-0.35	-0.45	-0.46	-0.05	-0.17	-0.04	0.13	a	0.12	0.17	0.05	-0.04
8.....	-0.35	-0.45	-0.46	-0.22	-0.20	0.74	0.12	a	0.04	0.00	0.01	1.4
9.....	-0.36	-0.39	-0.47	-0.26	-0.20	0.54	a	a	1.3	0.35	0.09	0.46
10.....	-0.34	-0.42	-0.47	-0.27	-0.19	0.10	a	a	0.61	0.66	4.7	0.06
11.....	-0.36	-0.34	-0.47	-0.29	-0.22	-0.01	a	a	0.41	1.3	2.5	-0.08
12.....	-0.36	-0.45	-0.46	-0.29	-0.23	0.03	a	a	0.26	0.59	1.3	-0.13
13.....	-0.38	-0.46	-0.41	-0.26	-0.24	0.04	a	a	0.20	0.37	0.60	-0.18
14.....	-0.39	-0.46	-0.45	-0.25	-0.26	0.52	a	0.40	0.11	0.28	0.80	-0.20
15.....	-0.39	-0.46	-0.45	-0.26	-0.26	0.46	a	0.18	-0.04	0.09	0.16	-0.20
16.....	-0.39	-0.47	-0.40	-0.25	-0.27	0.12	a	0.02	0.62	1.1	0.14	1.0
17.....	-0.39	-0.47	-0.38	-0.30	-0.26	-0.01	a	-0.09	1.45	0.32	0.50	0.01
18.....	-0.40	-0.47	-0.42	-0.30	-0.16	-0.10	a	0.00	1.1	0.19	0.24	-0.15
19.....	-0.40	-0.47	-0.40	-0.32	-0.10	-0.14	a	a	0.32	0.08	0.08	-0.20
20.....	-0.40	-0.48	-0.32	-0.26	-0.15	-0.11	a	a	0.14	0.04	2.2	-0.18
21.....	-0.42	-0.47	-0.35	0.02	-0.13	-0.13	a	-0.16	0.12	0.05	2.3	-0.20
22.....	-0.42	-0.42	-0.38	-0.14	-0.16	0.01	-0.04	-0.16	0.03	0.00	4.7	-0.23
23.....	-0.42	-0.46	-0.40	-0.20	-0.16	0.02	0.20	0.04	-0.02	-0.06	0.96	-0.26
24.....	-0.42	-0.46	-0.36	-0.22	-0.22	-0.02	0.26	-0.05	-0.02	0.58	0.48	-0.26
25.....	-0.42	-0.46	-0.34	-0.23	-0.23	0.70	0.24	-0.02	-0.06	0.26	0.29	-0.27
26.....	-0.42	-0.47	-0.34	-0.22	-0.26	0.12	-0.04	0.10	-0.12	0.30	0.14	0.86
27.....	-0.43	-0.47	-0.34	-0.20	-0.25	-0.01	-0.10	a	-0.04	1.05	0.06	0.08
28.....	-0.44	-0.47	-0.34	-0.20	-0.26	-0.10	-0.12	0.10	-0.02	0.82	-0.01	-0.12
29.....	-0.38	-0.45	-0.36	-0.12	-0.06	-0.13	-0.14	.....	-0.07	0.65	-0.06	-0.19
30.....	-0.35	-0.46	-0.37	-0.15	-0.10	-0.16	-0.15	.....	-0.09	0.25	-0.10	-0.22
31.....	-0.41	-0.44	.....	0.13	.....	-0.14	0.01	.....	-0.05	.....	-0.14	.....

a No record.

Daily discharge, in second-feet, of LITTLE TONAWANDA CREEK AT LINDEN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	5.9	1.2	0.9	2.4	18	14	59	11	158	17	35	10
2.....	4.3	1.0	0.8	2.7	14	11	46	9.2	46	17	28	9.6
3.....	3.2	1.0	0.6	3.2	11	9.6	21	9.2	25	14	22	8.2
4.....	3.0	1.2	0.6	3.8	16	11	35	10	32	14	24	7.8
5.....	2.7	1.3	1.3	3.5	18	10	30	12	51	14	73	11
6.....	2.1	1.0	1.2	11	13	22	28	10	39	18	32	18
7.....	2.1	0.9	0.8	14	9.6	17	29	8	28	32	23	17
8.....	2.1	0.9	0.8	7.4	8.2	91	28	6	22	19	20	180
9.....	2.7	1.9	0.6	5.9	8.2	68	18	5	165	49	26	60
10.....	3.2	1.3	0.6	5.5	8.7	26	14	5	76	82	940	23
11.....	2.7	3.2	0.6	4.7	7.4	19	12	5	55	165	380	14
12.....	2.7	0.9	0.8	4.7	7.0	21	12	7	40	74	165	12
13.....	2.1	0.8	1.5	5.9	6.6	22	14	20	35	51	75	9.2
14.....	1.9	0.8	0.9	6.2	5.9	66	26	54	27	42	44	8.2
15.....	1.9	0.8	0.9	5.9	5.9	60	22	33	17	26	32	8.2
16.....	1.9	0.6	1.6	5.1	5.5	28	19	21	77	136	30	123
17.....	1.9	0.6	2.1	4.3	5.9	19	18	14	188	46	64	20
18.....	1.6	0.6	1.3	4.3	10	13	18	19	136	34	39	11
19.....	1.6	0.6	1.6	3.8	13	11	16	13	46	25	25	8.2
20.....	1.6	0.5	3.8	5.9	11	12	15	11	30	22	320	9.2
21.....	1.3	0.6	3.0	21	12	12	15	10	28	23	340	8.2
22.....	1.3	1.3	2.1	11	10	20	17	10	21	19	940	7.0
23.....	1.3	0.8	1.6	8.2	8.7	21	35	22	18	16	116	5.9
24.....	1.3	0.8	2.7	7.4	7.4	18	43	16	18	73	62	5.9
25.....	1.3	0.8	3.2	7.0	7.0	86	39	18	14	40	43	5.5
26.....	1.3	0.6	3.2	7.4	5.9	28	17	26	12	44	30	105
27.....	1.2	0.6	3.2	8.2	5.1	13	13	24	17	130	24	25
28.....	1.0	0.6	3.2	8.2	5.9	13	12	26	18	100	19	12
29.....	2.1	0.9	2.7	12	16	12	11	.....	15	80	16	8.7
30.....	2.1	0.8	2.4	11	13	10	11	.....	14	40	18	7.4
31.....	1.5	1.0	.....	29	.....	11	20	.....	16	.....	11	.....
Mean...	2.16	0.964	1.69	7.76	9.80	25.8	23.0	15.5	47.9	48.7	129	25.3

NOTE.—Discharge estimated, January 9 to 21, February 6 to 13, 19, 20 and 27, by comparing gage-height record with that of Allegheny, Red House, Cattaraugus and Versailles.

Monthly discharge of LITTLE TONAWANDA CREEK AT LINDEN, for the year ended June 30, 1919

[Drainage area, 22 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	5.9	1.0	2.16	0.098	0.11
August.....	3.2	0.5	0.964	0.044	0.05
September.....	3.8	0.6	1.69	0.077	0.09
October.....	29	2.4	7.76	0.353	0.41
November.....	18	5.1	9.80	0.446	0.50
December.....	91	9.6	25.8	1.17	1.35
January.....	59	11	23.0	1.04	1.20
February.....	54	5	15.5	0.705	0.73
March.....	188	12	47.9	2.18	2.51
April.....	165	14	48.7	2.21	2.47
May.....	940	11	129	5.86	6.76
June.....	180	5.5	25.3	1.15	1.28
The year.....	940	0.5	28.1	1.28	17.46

GAGING OF STREAMS: NIAGARA RIVER DRAINAGE 33

ERIE CANAL ABOVE LOCK No. 35, AT LOCKPORT

Gage No. 504

A new station was established above lock No. 35 in the city of Lockport. A painted wooden gage, No. 504, is located on the north wall of the lock about midway between the upper and lower gates and just above the head of the locks in the old canal; the range is eight feet, between elevations 563.5 and 571.5. The nearest bench-mark is state B. M. No. 526-D, the bottom step of old lock No. 71, at elevation 560.130 (B. C. datum).

The gage is read by an employee of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL ABOVE LOCK No. 35, AT LOCKPORT, for the year ended June 30, 1919. W. P. Gyatt, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	566.7	566.1	566.2	566.1	566.5	567.3	566.4	567.0	566.4	566.7	.....	567.3
2.....	566.8	566.1	566.1	566.2	566.6	565.2	568.3	566.6	566.6	566.9	566.2	567.5
3.....	566.2	566.1	566.0	566.2	566.7	566.0	566.9	566.6	566.6	567.0	566.2	567.6
4.....	566.1	566.1	566.2	566.2	566.2	565.9	567.1	565.9	567.0	567.0	566.0	567.6
5.....	566.0	566.3	566.0	566.1	565.8	565.9	567.0	566.9	566.4	566.8	567.7	567.6
6.....	566.2	566.2	566.2	566.6	565.9	565.7	566.5	567.3	566.4	566.9	566.2	567.6
7.....	566.2	566.3	566.2	566.4	566.0	565.9	566.5	566.9	566.4	566.9	567.5	567.8
8.....	566.0	566.4	566.1	566.7	566.2	565.5	566.6	566.8	566.5	566.9	567.2	567.6
9.....	566.2	566.4	566.3	566.0	565.7	565.7	566.6	567.1	566.0	566.7	567.0	567.7
10.....	566.7	566.3	566.9	566.1	566.2	565.5	567.4	566.5	566.8	566.9	566.5	568.0
11.....	566.2	566.3	565.9	566.4	566.3	565.6	567.4	566.4	567.4	566.9	568.0	567.7
12.....	566.0	566.3	566.1	566.3	565.9	566.3	566.0	566.3	567.6	567.4	566.4	567.6
13.....	565.7	566.4	566.4	566.5	565.9	565.7	566.7	566.2	567.4	567.6	566.4	567.5
14.....	565.7	566.4	566.8	566.4	565.9	566.0	566.5	566.0	565.7	567.2	566.1	567.5
15.....	565.8	566.2	566.2	566.4	566.2	566.4	566.4	566.6	566.6	567.1	567.9	567.7
16.....	566.0	566.2	566.3	566.1	565.7	566.8	566.9	566.8	566.6	566.1	567.7	567.7
17.....	565.8	565.9	566.2	566.1	565.9	566.4	566.8	566.8	566.9	566.3	567.7	567.7
18.....	566.3	565.5	566.1	566.3	565.6	565.9	566.6	566.7	567.2	567.8	566.3	567.5
19.....	566.3	565.8	566.3	566.0	565.9	566.2	566.5	566.8	566.1	567.7	566.1	567.5
20.....	566.3	566.0	566.5	566.2	566.7	566.2	566.5	566.5	567.6	.....	567.4	567.6
21.....	566.4	566.3	566.6	566.0	566.1	566.2	566.4	566.3	567.2	.....	567.6	567.6
22.....	566.5	566.2	566.3	566.2	566.0	566.3	566.4	566.5	566.9	.....	568.2	567.4
23.....	566.3	566.4	566.7	566.1	566.0	566.8	566.5	566.1	566.8	.....	569.5	567.3
24.....	566.2	566.3	566.3	565.7	566.2	566.0	567.0	567.4	566.9	.....	570.1	567.2
25.....	566.2	566.2	566.2	566.1	566.8	566.0	566.8	566.7	566.9	.....	569.7	567.5
26.....	566.3	566.2	566.0	565.9	566.2	567.4	566.5	566.4	566.7	.....	568.5	567.4
27.....	566.2	566.1	566.4	565.6	565.8	566.8	567.3	567.1	567.0	.....	567.9	567.5
28.....	566.0	566.1	566.0	565.9	566.0	566.7	566.6	566.5	567.2	.....	567.6	567.1
29.....	566.2	566.5	566.9	566.2	566.6	566.8	566.9	.....	567.2	.....	567.6	567.1
30.....	566.2	566.2	566.2	565.9	566.6	567.2	567.1	.....	567.1	.....	567.7	567.2
31.....	566.1	566.2	.....	566.1	.....	566.6	567.1	.....	567.0	.....	567.7	.....

Form.—Guard-gate closed and water drawn, April 20 to 30, 1919. Guard-gate opened May 1, 1919.

ERIE CANAL BELOW LOCK No. 34, AT LOCKPORT

Gage No. 503

A new station was established at lock No. 34, below the lock, in the city of Lockport. A painted wooden gage, No. 503, was placed at the west end of the buffer-beam recess on the south lock wall, opposite the power-house; the range is eight feet, between elevations 508.9 and 516.9 (B. C. datum). The nearest benchmark is state B. M. No. 526, the bottom step of old lock No. 67, at elevation 519.940 (B. C. datum).

The gage, is read by an employee of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL BELOW LOCK No 34, AT LOCKPORT, for the year ended June 30, 1919. W. P. Gyatt, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	512.8	513.5	514.1	513.7	514.0	514.2	512.5	510.1	510.4	510.8	.....	513.2
2.....	512.9	513.5	514.3	513.5	513.6	514.1	511.8	509.1	510.3	510.8	506.9	513.2
3.....	512.9	513.5	514.1	513.5	513.6	514.8	512.2	509.1	510.3	511.9	510.4	513.5
4.....	512.8	513.5	513.9	513.4	514.3	514.7	512.2	510.1	510.5	511.9	513.9	513.5
5.....	513.1	513.6	513.7	513.6	514.1	514.7	512.2	510.4	510.6	511.7	513.2	513.5
6.....	513.0	513.8	513.9	513.5	514.0	514.9	511.6	510.2	510.7	511.6	513.4	513.5
7.....	512.9	513.7	513.8	513.5	514.3	514.7	511.6	510.3	510.4	510.3	513.6	513.6
8.....	512.9	513.8	513.9	513.5	514.1	515.0	511.6	510.8	510.5	511.6	513.6	513.5
9.....	512.8	513.9	514.1	513.8	514.1	514.9	511.6	510.1	509.9	512.5	513.7	513.5
10.....	512.8	513.7	514.1	513.9	514.1	514.9	511.6	509.7	510.2	512.1	513.6	513.5
11.....	512.9	513.6	514.1	513.8	513.8	515.0	511.7	510.1	511.3	512.6	513.7	513.7
12.....	513.2	513.6	514.0	513.5	513.8	514.7	509.9	510.2	510.9	512.1	513.5	513.5
13.....	514.0	513.6	514.0	513.5	514.1	514.7	507.8	510.3	510.6	510.1	513.5	513.2
14.....	514.0	513.8	513.8	513.6	514.1	514.7	509.9	510.1	510.2	509.9	513.7	513.4
15.....	514.2	514.0	513.9	513.5	513.9	514.2	510.8	510.2	510.2	511.8	513.6	513.6
16.....	514.1	514.0	514.1	513.6	514.0	513.5	511.0	510.0	510.5	511.8	512.6	513.4
17.....	514.1	514.0	513.9	513.5	514.0	513.7	511.1	509.7	509.7	511.8	513.1	513.3
18.....	513.9	514.1	514.1	513.6	514.1	513.9	511.3	509.2	510.8	512.7	513.0	513.5
19.....	513.5	513.9	514.0	513.6	514.1	513.9	511.3	509.2	511.7	512.6	513.0	513.5
20.....	513.3	513.7	514.3	513.5	514.0	513.2	511.5	509.2	511.2	.....	513.2	513.5
21.....	513.0	513.6	513.7	513.5	514.4	512.7	511.7	509.1	510.5	.....	513.3	513.6
22.....	513.0	513.7	513.9	513.7	514.1	511.8	511.8	509.2	510.0	.....	513.2	513.4
23.....	513.0	513.7	513.6	513.8	514.0	511.2	511.7	509.9	509.7	.....	513.1	513.7
24.....	513.1	513.7	513.8	513.0	513.9	512.3	511.5	509.9	509.7	.....	512.6	513.9
25.....	513.0	513.7	513.7	513.9	514.1	512.1	511.7	510.5	510.7	.....	512.9	513.7
26.....	513.1	513.6	513.7	513.0	514.1	512.1	511.1	510.4	509.0	.....	512.9	513.9
27.....	513.3	513.6	513.6	513.1	514.1	512.3	510.3	510.6	510.8	.....	512.9	513.8
28.....	513.5	513.6	513.6	513.1	513.9	512.5	510.2	510.2	511.5	.....	512.8	513.9
29.....	513.5	513.6	513.6	513.0	514.1	512.1	510.1	.....	511.5	.....	512.8	513.8
30.....	513.7	513.7	513.7	513.0	514.3	512.0	510.3	.....	510.9	.....	512.6	513.7
31.....	513.7	513.6	.....	513.9	.....	512.4	509.9	.....	509.0	.....	512.6	.....

NOTE.—Guard-gate closed and water drawn, April 20 to 30, 1919. Guard-gate opened May 1, 1919.

GENESEE RIVER DRAINAGE BASIN**GENESEE RIVER****DESCRIPTION**

Genesee river rises in Potter county, Pa., 8 or 10 miles south of the New York-Pennsylvania boundary, flows northwestward for about 32 miles by general course, then turns to the northeast and empties into Lake Ontario, 7 miles north of Rochester. The entire length of the stream, following bends, is about 135 miles and the drainage area is about 2,450 square miles.

In the 39 miles between Belmont, in central Allegany county, and Portage, in southwestern Livingston county, the fall of the water-surface is 253 feet, an average of 6.4 feet per mile. At Portage the river plunges down in three magnificent falls and thence nearly to Mount Morris flows at the bottom of a deep gorge. From Mount Morris to Rochester the valley is broad and open and the stream is bordered by meadows subject to occasional overflow. At Rochester there is another abrupt descent over three heavy falls, amounting to about 260 feet within the city.

In the northern counties the surface is rolling, with long, easy slopes, except along the streams, which usually lie in deep ravines, hemmed in by steep banks. On the whole there is a gradual rise away from the lakes and in the upper half of the basin the country becomes rough and is broken by ridges, the summits of which attain elevations of from 2,000 to 2,500 feet above tide.

Precipitation is rather low, the average rainfall being about 35 inches, some 14 inches smaller than that of the upper Sacandaga.

Above all the private dams at Rochester the State formerly maintained a dam for diverting water to the Erie canal, and in the basin of Black creek, one of the upper tributaries of the Genesee from the west, are two reservoirs (Rockville and Cuba reservoirs), owned by the State, also used for the benefit of the Erie canal.

Cuba reservoir, on the Genesee-Allegheny divide, receives the drainage from a tributary area of 26.6 square miles. The storage volume is 454,000,000 cubic feet. The overflow from this reservoir enters Allegheny river. The storage water may be turned into the summit level of the abandoned Genesee Valley canal and thence into Genesee river.

The series of remarkable lakes tributary to the Oswego basin is continued westward into the basin of the Genesee and includes Conesus, Hemlock, Canadice, and Honeoye lakes. These lakes serve as natural reservoirs and have inlets draining considerable areas at their upper ends. The slopes adjacent to the lakes themselves are narrow and steep and are drained by gullies and torrential brooks. The area below the lakes is rolling and the soil is rich and extensively cultivated. The areas and elevations of these lakes are shown in the following table:

Areas and elevation of LAKES IN GENESSEE RIVER BASIN ^a

LAKE	Elevation	Water-surface area	Drainage area	Per cent, water-surface
	<i>Feet</i>	<i>Square miles</i>	<i>Square miles</i>	
Hemlock lake.....	896	2.8	46.8	5.98
Canadice lake.....	1,092	1.0	12.6	7.94
Honeoye lake.....	800	2.5	39.6	6.31

^a These lake basins are shown on the Honeoye, Canandaigua, Naples and Wayland topographic atlas sheets of the United States Geological Survey, from which the area of Honeoye lake has been taken. Areas of Hemlock and Canadice lakes are from surveys of the Rochester water-works.

Drainage areas of tributaries of GENESSEE RIVER ^a

NAME OF STREAM	AREA IN SQUARE MILES		
	GENESSEE RIVER		
	Tributary	Above tributary	Below tributary
Cryder creek.....	43.3	99.9	143.2
Chenunda creek.....	30.0	181.0	211.0
Dyke's creek.....	63.3	214.0	282.3
Vandemark creek.....	21.6	301.3	322.9
Knight's creek.....	22.3	323.9	346.2
Phillips creek.....	32.3	372.8	405.1
Vancampens creek.....	55.7	410.4	466.1
Angelica creek.....	82.1	481.1	563.2
White creek.....	15.9	599.2	585.1
Black creek (Allegany county).....	31.1	595.5	626.6
Crawford creek.....	11.8	637.6	649.4
Canadice creek.....	63.3	651.0	714.3
Cold creek.....	41.0	745.3	786.3
Rush creek.....	35.3	787.0	822.3
Wisoy creek (including East Koy creek).....	108.6	833.6	942.2
East Koy creek.....	59.9	.....	.....
Wolf creek.....	19.3	974.9	994.2
Silver lake outlet.....	30.4	1,029.2	1,059.6
Canaseraga creek, Livingston Co. (including Keshequa creek).....	340.7	1,066.4	1,407.1
Keshequa creek (formerly Coshaqua).....	82.0	.....	.....
Beards creek.....	41.3	1,423.1	1,464.4
Conesus lake outlet.....	88.3	1,555.5	1,643.9
Honeoye creek.....	282.6	1,675.9	1,938.5
Allen's creek.....	198.1	1,947.1	2,145.2
Black creek (Monroe county).....	211.8	2,168.5	2,380.0
Genesee river, total at mouth.....	.....	.....	2,445.6

^a From an early report on Genesee river storage, Report of State Engineer, 1890, plate facing p. 422.

GENESEE RIVER AT SCIO

Location.—At the steel highway bridge, $\frac{1}{4}$ mile above Vandemark creek, $\frac{1}{2}$ mile above the village of Scio, Allegany county, and 1 mile above Knight creek.

Drainage area.—288 * square miles.

Records available.—June 12, 1916, to June 30, 1919.

Gage.—Vertical staff, attached to downstream face of left bridge abutment; read by Miss Retta Potter and Mrs. Margaret Potter.

Discharge measurements.—Made from the downstream side of the bridge at medium and high stages and by wading at low stages.

Channel and control.—Coarse gravel and probably permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 9.1 feet at noon May 22; discharge, 10,600 second-feet. Minimum stage recorded, 0.58 foot at 5 P. M., August 28; discharge, 38 second-feet.

1916–1919: Maximum stage recorded; 9.1 feet at noon May 22, 1919; discharge, 10,600 second-feet. Minimum stage recorded, 0.60 foot, August 25 and 26, 1916; discharge, 25 second-feet.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Affected by ice during a large portion of the period from December to March, inclusive. Rating curve well defined between 25 and 5,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results good except for periods when the stage-discharge relation is affected by ice, when results are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

*Revised area as computed by engineers of the State Conservation Commission. Formerly given as 297 square miles.

Discharge measurements of GENESEE RIVER AT SCIO, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 23.....	E. D. Burchard.....	0.69	56.7
Aug. 23.....	E. D. Burchard.....	0.69	58.2
1919			
Jan. 23.....	E. D. Burchard.....	1.24	234
Apr. 3.....	J. W. Moulton.....	1.48	308
Apr. 19.....	M. H. Carson.....	2.15	677
May 19.....	J. W. Moulton.....	2.19	709
June 19.....	J. W. Moulton.....	0.89	126

Daily gage height, in feet, of GENESEE RIVER AT SCIO, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1.5	0.70	1.09	1.25	1.30	1.20	1.6	1.05	2.8	1.5	1.48	1.6
2.....	1.45	0.60	0.75	1.20	1.45	1.20	2.5	1.15	1.41	1.47	1.48	1.44
3.....	1.40	0.60	0.74	1.30	1.5	1.20	1.85	1.26	1.30	1.48	1.37	1.32
4.....	1.35	0.60	0.72	1.20	1.6	1.20	1.7	1.02	1.28	1.7	1.5	1.24
5.....	1.30	1.7	0.75	1.20	1.65	1.20	1.65	1.08	1.5	1.9	1.5	1.18
6.....	1.25	1.00	1.32	1.7	1.5	1.20	1.6	0.92	1.6	1.75	1.42	1.10
7.....	1.20	0.80	1.00	1.6	1.48	1.20	1.75	1.05	1.5	1.7	1.5	2.15
8.....	1.15	0.80	0.90	1.45	1.44	1.30	1.6	0.94	1.43	2.8	1.55	1.6
9.....	1.15	1.00	0.89	1.30	1.42	1.20	1.55	1.7	2.15	3.1	1.7	2.45
10.....	0.95	0.85	0.89	1.20	1.5	1.20	1.40	1.29	2.1	3.5	4.2	1.6
11.....	0.75	1.20	0.90	1.20	1.30	1.20	1.7	1.05	1.85	4.3	3.9	1.40
12.....	0.70	1.00	0.90	1.20	1.30	1.20	1.36	1.05	1.65	4.0	3.8	1.24
13.....	0.60	1.00	1.00	1.30	1.30	1.20	1.5	1.03	1.65	3.2	3.0	1.12
14.....	0.70	1.00	1.05	1.20	1.34	1.30	1.32	1.24	1.36	2.8	2.6	1.00
15.....	0.60	1.00	1.00	1.30	1.30	1.30	1.42	1.38	1.39	2.5	2.4	0.86
16.....	0.60	1.00	0.98	1.30	1.30	1.40	1.44	1.07	1.38	2.8	2.35	0.80
17.....	0.60	0.90	1.40	1.20	1.5	1.6	1.20	0.99	2.25	2.5	3.0	a
18.....	0.70	0.90	1.30	1.20	2.2	1.7	1.43	1.07	3.0	2.3	2.5	a
19.....	0.60	0.90	1.20	1.10	4.8	1.6	1.19	1.25	2.2	2.1	2.15	a
20.....	0.60	0.80	4.2	1.10	4.2	1.6	1.28	1.22	2.0	2.0	2.25	1.42
21.....	0.60	0.80	2.25	1.20	2.2	1.6	1.46	0.94	1.95	2.1	5.6	1.25
22.....	0.60	0.80	1.85	1.10	2.0	1.65	1.10	0.88	1.85	1.8	7.8	0.97
23.....	0.60	0.70	1.7	1.00	1.9	1.8	1.26	0.90	1.6	1.75	6.2	0.88
24.....	0.60	0.70	1.6	0.98	1.7	1.9	1.7	0.89	1.6	1.8	5.4	0.80
25.....	0.70	0.70	1.5	1.00	1.6	1.8	1.36	0.92	1.49	1.8	4.4	0.77
26.....	0.70	0.60	1.40	1.14	1.5	1.7	1.33	1.07	1.44	1.7	3.4	1.12
27.....	0.60	0.60	1.40	1.12	1.5	1.6	1.28	0.86	1.5	1.65	2.9	1.7
28.....	0.60	0.59	1.25	1.10	1.40	1.5	1.20	1.00	1.85	1.6	2.35	1.29
29.....	0.60	0.61	1.25	1.10	1.30	1.40	1.20	a	a	1.6	2.15	1.05
30.....	0.70	0.75	1.20	1.35	1.20	1.40	1.18	a	a	1.47	1.95	0.94
31.....	0.70	0.91	.....	1.40	.....	1.40	1.05	.....	1.75	.....	1.75	.....

a No record.

Daily discharge, in second-feet, of GENESEE RIVER AT SCIO, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	345	61	178	238	258	218	390	164	1,150	345	336	390
2.....	322	41	74	218	322	218	920	200	304	332	336	318
3.....	300	41	71	258	345	218	518	242	258	336	287	266
4.....	279	41	66	218	390	218	440	154	250	440	345	234
5.....	258	440	74	218	415	218	415	174	345	545	345	211
6.....	238	147	264	440	345	218	390	122	390	465	309	181
7.....	218	87	147	390	336	218	465	164	345	440	345	690
8.....	200	87	161	322	318	258	390	128	314	1,150	368	390
9.....	200	147	113	258	309	218	368	440	690	1,400	440	885
10.....	132	102	113	218	345	218	300	254	660	1,780	2,540	390
11.....	74	218	116	218	258	218	440	164	518	2,680	2,210	300
12.....	61	147	116	218	258	218	253	164	415	2,320	2,100	234
13.....	41	147	147	258	258	218	345	167	415	1,490	1,810	188
14.....	61	147	164	218	275	258	266	234	253	1,150	990	147
15.....	41	147	147	258	258	258	309	292	296	920	850	104
16.....	41	147	141	258	258	300	318	171	292	1,150	815	87
17.....	41	116	300	218	345	390	218	144	750	920	1,810	* 180
18.....	61	116	258	218	720	440	314	171	1,310	780	920	* 180
19.....	41	116	218	181	3,310	390	214	238	720	690	690	* 120
20.....	41	87	2,540	181	2,540	390	250	226	600	600	750	309
21.....	41	87	750	218	720	390	327	128	572	660	4,390	238
22.....	41	87	518	181	600	415	181	110	518	490	8,090	138
23.....	41	61	440	147	545	490	242	116	390	465	5,800	110
24.....	41	61	390	141	440	545	440	113	390	490	4,110	87
25.....	61	61	345	147	390	490	283	122	340	490	2,780	79
26.....	61	41	300	196	345	440	271	171	318	440	1,680	188
27.....	41	41	300	188	345	390	250	104	345	415	1,230	440
28.....	41	39	238	181	300	345	218	147	518	390	815	254
29.....	41	43	238	181	258	300	218	.....	480	390	690	164
30.....	61	74	218	279	218	300	211	.....	500	832	672	128
31.....	61	119	.....	300	.....	300	164	.....	465	.....	465	.....
Mean...	114	106	308	231	534	313	334	179	488	815	1,540	254

* Discharge estimated, by comparing with hydrograph of Genesee river at St. Helena and Jones Bridge stations.

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of GENESEE RIVER AT SCIO, for the year ended June 30, 1919
[Drainage area, 288 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	345	41	114	0.384	0.44
August.....	440	39	106	0.357	0.41
September.....	2,540	66	303	1.02	1.14
October.....	440	141	231	0.802	0.92
November.....	3,310	218	534	1.85	2.06
December.....	545	218	313	1.09	1.26
January.....	920	164	334	1.16	1.34
February.....	440	104	179	0.622	0.58
March.....	1,310	250	488	1.69	1.95
April.....	2,680	332	815	2.83	3.16
May.....	8,090	287	1,540	5.35	6.17
June.....	885	79	254	0.882	0.96
The year.....	8,090	39	434	1.51	20.41

GENESEE RIVER AT ST. HELENA

Location.—At the steel highway bridge in the hamlet of St. Helena, Wyoming county, about $5\frac{1}{2}$ miles below the village of Portageville and the site of the proposed storage dam of the New York State Conservation Commission, and about $9\frac{1}{2}$ miles above the mouth of Canaseraga creek.

Drainage area.—992* square miles.

Records available.—August 14, 1908, to June 30, 1919.

Gages.—Stevens water-stage recorder on left bank just below bridge and a chain gage fastened to the upstream side of the bridge, middle span. Chain gage installed August 14, 1908; water-stage recorder installed August 24, 1911. Water-stage recorder inspected by C. S. DeGolyer. Chain gage read by Herman Piper.

Discharge measurements.—Made from the bridge at high stages and by wading at low and medium stages.

Channel and control.—Gravel and rocks; occasionally shifting.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 11.35 feet at 4:30 P. M., May 22; discharge, 32,800 second-feet. Minimum stage from water-stage recorder, 2.0 feet at 7 A. M., July 26, and 6 P. M., August 30; discharge, 59 second-feet.

1908–1919: Maximum stage, from water-stage recorder, 12.81 feet at 8 A. M., May 17, 1916; discharge, 43,500 second-feet. Minimum stage recorded, 1.70 feet at 5 P. M., October 5, and 8 A. M., October 17, 1913; discharge, approximately 18 second-feet.

Ice.—Stage-discharge relation somewhat affected by ice.

Accuracy.—State-discharge relation not permanent. Rating curve for water-stage recorder well defined between 75 and 2,000 second-feet and fairly well defined between 2,000 and 30,000 second-feet. Rating curve for chain gage well defined between 500 and 1,600 second-feet. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table except for days of great range in stage, when it was determined by averaging results obtained by applying to rating table gage heights for 2-hour periods. Records good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 1,030 square miles.

GAGING OF STREAMS: GENESEE RIVER BASIN

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Discharge measurements of GENESEE RIVER AT ST. HELENA, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 13.....	E. D. Burchard.....	2.51	191
July 13.....	E. D. Burchard.....	2.50	191
July 25.....	C. S. DeGolyer.....	2.15	71
Aug. 21.....	E. D. Burchard.....	2.40	144
Aug. 28.....	C. S. DeGolyer.....	2.10	57.6
Sept. 20.....	C. S. DeGolyer.....	3.23	579
Nov. 23.....	C. S. DeGolyer.....	3.86	1,280
Dec. 26.....	C. S. DeGolyer.....	4.30	1,780
1919			
Jan. 11.....	C. S. DeGolyer.....	3.14	574
April 11.....	C. S. DeGolyer.....	6.47	5,920
May 12.....	C. S. DeGolyer.....	6.34	5,980
May 15.....	J. W. Moulton.....	4.52	2,070
May 22.....	C. S. DeGolyer.....	11.03	3,220
June 16.....	J. W. Moulton.....	3.05	470

Daily gage height, in feet, of GENESEE RIVER AT ST. HELENA, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.64	a	2.28	2.89	4.7	3.35	3.6	2.79	4.6	3.5	3.95	3.85
2.....	2.65	a	2.26	3.05	4.3	3.0	6.0	2.81	3.95	3.4	3.95	3.7
3.....	2.52	a	2.48	3.10	4.05	3.1	4.5	2.80	3.55	3.35	3.85	3.55
4.....	2.48	a	2.36	3.15	3.9	3.25	3.7	2.95	3.4	3.5	3.75	3.45
5.....	2.49	a	2.48	2.98	4.1	3.15	3.5	2.91	3.65	3.9	4.15	3.35
6.....	2.41	a	2.55	3.0	4.1	3.2	3.35	2.82	4.0	3.9	4.0	3.3
7.....	2.41	a	2.79	3.35	3.75	3.1	3.4	2.80	3.7	3.8	3.75	3.85
8.....	2.22	a	2.69	3.3	3.5	3.25	3.6	2.82	3.6	3.85	3.85	3.85
9.....	2.45	a	2.55	3.1	3.4	5.3	3.4	2.80	4.6	4.9	3.85	4.35
10.....	2.40	a	2.54	2.98	3.35	4.2	3.1	2.84	5.3	6.0	a	4.15
11.....	2.50	a	2.44	2.89	3.4	3.8	3.05	2.52	4.7	7.4	a	3.65
12.....	2.48	a	2.58	2.88	3.3	3.7	3.45	2.82	4.2	7.6	a	3.35
13.....	2.46	a	2.56	2.86	3.2	3.8	3.5	2.80	4.25	5.5	a	3.25
14.....	a	a	2.81	2.98	3.1	4.5	3.4	2.85	3.55	5.3	a	3.1
15.....	a	a	2.78	2.86	2.96	5.3	3.4	3.75	3.45	4.8	4.7	3.1
16.....	a	a	2.78	2.92	3.0	4.8	3.5	3.25	3.95	5.1	4.5	3.05
17.....	a	a	2.80	2.84	2.92	4.1	3.35	2.92	5.4	5.1	a	2.98
18.....	a	a	3.8	2.72	4.05	3.8	3.3	2.82	6.1	4.7	a	2.99
19.....	a	a	3.75	2.76	5.1	3.55	3.3	2.71	4.8	4.45	4.6	2.87
20.....	a	a	3.5	2.62	4.4	3.45	3.1	2.74	4.4	4.15	a	2.82
21.....	a	a	a	2.72	4.15	3.4	3.15	2.88	4.15	4.2	a	3.15
22.....	a	a	a	2.91	3.95	3.5	3.2	2.84	4.0	4.05	a	3.1
23.....	a	a	a	2.82	3.8	4.35	3.4	2.86	3.75	3.8	a	2.86
24.....	a	a	a	2.70	3.6	4.4	4.25	2.91	3.55	4.25	a	2.78
25.....	a	a	a	2.76	3.45	4.45	3.9	2.98	3.45	4.35	a	2.75
26.....	a	a	a	2.72	3.2	4.3	3.6	2.98	3.4	4.15	a	2.90
27.....	a	a	a	3.2	3.25	3.7	3.45	2.94	3.35	4.4	a	3.5
28.....	a	a	a	3.2	2.98	3.5	3.3	2.81	3.6	4.5	4.8	3.45
29.....	a	a	a	3.15	3.15	3.3	3.2	.....	3.65	4.6	4.5	3.1
30.....	a	a	a	3.4	3.3	3.15	3.15	.....	3.55	4.2	4.25	2.92
31.....	a	2.26	a	6.2	.....	3.15	2.98	.....	3.65	.....	4.0	.....

a No record.

Daily discharge, in second-feet, of GENESEE RIVER AT ST. HELENA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	257	132	109	348	2,470	748	985	336	1,770	860	1,300	1,200
2.....	262	140	103	450	1,840	470	5,360	348	985	772	1,300	1,050
3.....	199	126	182	470	1,500	540	2,140	342	906	730	1,200	906
4.....	182	115	136	540	1,310	662	1,090	436	772	860	1,100	838
5.....	186	225	182	403	1,560	580	885	410	1,000	1,250	1,540	748
6.....	154	451	214	423	1,560	620	748	354	1,360	1,250	1,360	705
7.....	154	293	335	705	1,140	540	790	342	1,050	1,150	1,100	1,200
8.....	91	209	282	620	885	662	985	354	953	1,200	1,200	1,200
9.....	170	190	214	470	790	3,650	790	342	2,140	2,600	1,200	1,800
10.....	150	186	209	403	749	1,700	540	366	3,320	4,750	8,600	1,540
11.....	190	178	166	348	790	1,200	505	203	2,290	9,000	14,800	1,000
12.....	182	261	228	342	705	1,090	838	354	1,600	9,800	6,220	748
13.....	174	257	218	331	620	1,200	885	342	1,660	3,700	4,530	662
14.....	147	204	346	403	540	2,140	790	372	906	3,320	3,130	540
15.....	149	182	329	331	443	3,650	790	1,140	816	2,440	2,280	540
16.....	134	278	329	366	470	2,650	885	662	1,300	2,950	2,000	505
17.....	126	228	373	320	416	1,560	748	416	3,510	2,950	2,960	456
18.....	123	190	1,130	257	1,500	1,200	705	354	4,970	2,290	3,510	463
19.....	122	106	1,080	277	3,220	935	705	292	2,440	1,930	2,140	389
20.....	111	154	835	211	1,990	838	540	309	1,860	1,540	2,140	359
21.....	112	140	2,100	257	1,630	790	580	391	1,540	1,600	11,000	574
22.....	106	143	1,080	360	1,370	885	620	366	1,360	1,420	20,500	538
23.....	109	129	808	309	1,200	1,920	790	379	1,100	1,150	13,400	383
24.....	103	122	650	277	985	1,990	1,770	410	906	1,660	9,000	337
25.....	100	115	628	277	838	2,060	1,310	457	816	1,800	8,210	321
26.....	97	110	605	257	620	1,840	985	457	772	1,540	4,750	407
27.....	143	104	808	540	662	1,090	838	430	730	1,860	3,510	860
28.....	122	98	781	540	457	885	705	348	953	2,000	2,440	816
29.....	109	103	625	505	580	705	620	.....	1,000	2,140	2,000	538
30.....	122	115	507	705	705	680	580	.....	906	1,600	1,660	419
31.....	136	103	.....	5,710	.....	580	457	.....	1,000	.....	1,360	.....
Mean...	146	176	520	573	1,120	1,290	999	404	1,510	2,400	4,560	735

NOTE.— Discharge, July 1 to 13, and August 31 to September 20, determined from chain gage heights.

Monthly discharge of GENESEE RIVER AT ST. HELENA, for the year ended June 30, 1919

[Drainage area, 992 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	262	91	146	0.142	0.16
August.....	451	96	176	0.171	0.20
September.....	2,100	103	520	0.505	0.56
October.....	5,710	211	573	0.578	0.67
November.....	3,220	416	1,120	1.173	1.26
December.....	3,650	470	1,290	1.30	1.50
January.....	5,360	457	999	1.01	1.16
February.....	1,140	203	404	0.407	0.42
March.....	4,970	730	1,510	1.52	1.75
April.....	9,800	730	2,400	2.42	2.70
May.....	20,500	1,100	4,560	4.60	5.30
June.....	1,800	321	735	0.741	0.83
The year.....	20,500	91	1,203	1.21	16.51

GENESEE RIVER AT JONES BRIDGE, NEAR MT. MORRIS

Location.—At the highway bridge known as Jones bridge, $1\frac{1}{2}$ miles below Canaseraga creek, about $1\frac{3}{4}$ miles above the mouth of Beads creek, about 5 miles below the village of Mt. Morris, Livingston county, and 6 miles by river above the village of Geneseo.

Drainage area.—1,400 * square miles.

Records available.—May 22, 1903, to April 30, 1906; August 12, 1908, to December 31, 1913; July 12, 1915, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder, installed September 11, 1915, on the right bank about 60 feet downstream from the bridge. Prior to 1915 a chain gage fastened to upstream side of highway bridge. Datum of water-stage recorder is 2.73 feet higher than that for the chain gage (540.00 feet, Conservation Commission datum). Water-stage recorder inspected by Theron S. Trewer.

Discharge measurements.—Made from foot-bridge erected on lower chord of bridge truss at the upstream side of the bridge.

Channel and control.—Sandy clay; likely to shift, but, as shown by discharge measurements, fairly permanent in recent years.

Extremes of discharge.—Current year: Maximum stage, from water-stage recorder, 24.45 feet at 2 A. M., May 23; discharge, 32,000 second-feet. Minimum stage from water-stage recorder, 0.45 foot at 1 A. M., July 25; discharge, 63 second-feet.

1902-1919†: Maximum stage recorded, 25.44 feet at noon May 17, 1916; discharge, 55,100 second-feet. Minimum stage recorded, 2.7 feet at 6 P. M., August 29, 1909; discharge about 18 second-feet. See paragraph "Records Available" for limits of periods of no records.

Ice.—Stage-discharge relation seriously affected by ice.

Regulation.—During extreme low water there is some diurnal fluctuation in flow from mills at Mt. Morris.

Accuracy.—Stage-discharge relation practically permanent between dates of shift. Affected by ice for considerable portion of January, February and March. Rating curve well defined between 150 and 7,000 second-feet and fairly well defined between 7,000 and 60,000 second-feet. Operation of water-stage recorder

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 1,410 square miles.

† Not including periods of no record. See "Records available."

satisfactory throughout the year. Daily discharge ascertained by applying to the rating table mean daily gage heights determined by inspecting the gage-height hydrograph, or for days of considerable fluctuation by discharge integration.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS, during year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 12.....	E. D. Burchard.....	1.36	292
Aug. 21.....	E. D. Burchard.....	0.91	159
1919			
Jan. 24.....	E. D. Burchard.....	3.83	1,510
Mar. 4.....	E. D. Burchard.....	2.96	1,060
April 14.....	J. W. Moulton.....	7.93	4,130
May 13.....	O. W. Hartwell.....	13.86	7,060
May 14.....	O. W. Hartwell.....	10.50	5,930
May 24.....	J. W. Moulton.....	21.98	14,300
May 26.....	J. W. Moulton.....	15.35	8,960
June 14.....	J. W. Moulton.....	2.42	808

Daily gage height, in feet, of GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1.56	a	0.85	1.99	a	2.5	a	2.1	a	3.25	4.1	4.1
2.....	1.54	a	1.09	1.96	4.8	2.45	a	a	a	2.9	4.1	3.8
3.....	1.46	0.91	1.12	1.94	4.2	2.2	a	a	3.5	2.9	3.8	3.45
4.....	1.32	0.79	1.16	2.0	3.6	2.1	3.7	2.1	3.0	3.1	3.4	3.15
5.....	1.40	0.94	1.11	2.0	a	2.2	4.4	2.1	3.25	3.8	4.0	3.0
6.....	1.20	a	1.20	2.05	4.3	2.2	5.3	2.05	3.9	4.1	4.0	2.9
7.....	a	1.70	1.26	2.6	3.4	2.05	6.0	a	3.5	3.8	3.4	3.5
8.....	a	1.37	1.44	2.65	3.05	2.2	6.3	1.75	3.4	3.7	3.4	4.1
9.....	a	1.34	1.39	2.3	2.8	a	6.1	1.74	a	a	3.4	5.8
10.....	a	1.33	1.32	2.1	2.6	4.5	5.1	1.78	a	a	a	5.3
11.....	a	1.17	1.30	1.95	2.65	3.4	4.8	a	6.2	a	22.9	3.9
12.....	a	1.33	1.26	1.88	2.55	3.15	4.5	1.56	4.9	a	19.5	3.15
13.....	a	1.53	1.17	1.83	2.4	3.2	4.5	1.63	4.8	a	a	2.75
14.....	a	1.33	1.28	1.95	2.25	a	4.8	1.77	3.5	a	a	2.45
15.....	a	1.23	1.57	1.92	2.15	6.2	5.0	a	3.15	a	7.2	2.25
16.....	a	1.21	1.57	1.88	2.05	5.8	5.1	2.95	a	a	5.9	2.2
17.....	a	1.43	1.70	1.80	1.98	4.4	4.8	2.4	a	7.0	a	2.2
18.....	a	1.22	a	1.69	a	3.7	4.5	2.1	a	5.9	a	2.15
19.....	a	1.23	2.65	1.65	6.6	3.25	4.3	1.94	a	5.2	a	2.0
20.....	a	1.20	a	1.61	5.3	2.95	4.0	a	5.3	4.6	a	1.92
21.....	a	1.12	a	1.68	4.4	2.8	3.7	1.9	4.7	4.4	a	1.83
22.....	a	1.01	3.6	1.93	4.0	2.7	3.4	1.95	4.3	4.3	a	2.5
23.....	a	0.96	2.9	1.84	3.6	a	3.2	1.96	3.8	3.7	a	2.1
24.....	a	a	2.6	1.69	3.25	4.1	4.0	2.05	3.3	a	a	1.81
25.....	a	a	2.4	1.61	2.95	a	4.4	2.0	3.1	5.3	a	1.7
26.....	a	a	2.3	1.64	2.75	5.0	3.5	2.1	2.9	4.7	a	1.78
27.....	a	a	2.65	2.0	2.55	3.8	3.1	2.1	2.8	5.2	a	2.2
28.....	a	a	2.85	2.2	2.4	3.25	2.8	2.1	3.05	5.4	7.4	3.2
29.....	a	a	2.45	2.25	2.35	3.0	2.6	.....	3.4	5.8	5.8	2.6
30.....	a	a	2.15	2.65	2.5	2.7	2.5	.....	3.15	4.9	4.9	2.3
31.....	a	0.85	.....	a	.....	2.6	2.35	.....	3.35	.....	4.6	.....

a No record.

Daily discharge, in second-feet, of GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	365	165	140	560	3,310	815	1,110	615	1,250	1,220	1,720	1,720
2.....	357	162	204	545	2,150	790	4,470	603	2,200	1,030	1,720	1,540
3.....	327	155	213	535	1,780	665	2,970	637	1,360	1,030	1,540	1,330
4.....	278	126	226	565	1,420	615	1,480	615	1,080	1,140	1,300	1,170
5.....	305	162	210	565	2,210	665	1,200	615	1,220	1,540	1,660	1,080
6.....	238	413	238	590	1,840	665	1,000	590	1,600	1,720	1,660	1,030
7.....	155	425	258	865	1,300	590	1,000	465	1,360	1,540	1,300	1,360
8.....	273	295	319	892	1,110	665	1,100	448	1,300	1,480	1,300	1,720
9.....	258	285	302	715	975	3,040	1,100	443	2,040	2,800	1,300	2,820
10.....	275	298	278	615	865	1,960	1,000	461	4,830	5,390	8,580	2,480
11.....	269	229	271	540	892	1,300	950	445	3,100	2,400	20,500	1,600
12.....	255	281	258	506	840	1,170	850	365	2,220	5,800	13,500	1,170
13.....	235	353	229	484	765	1,200	850	394	2,150	8,920	8,630	948
14.....	190	281	264	540	690	1,800	1,000	456	1,360	5,010	5,420	790
15.....	236	248	369	525	640	3,100	1,100	966	1,170	3,280	3,780	690
16.....	223	241	369	506	590	2,820	1,100	1,060	1,250	3,440	2,890	665
17.....	216	316	425	470	555	1,900	1,100	765	4,350	3,690	3,640	665
18.....	189	245	1,470	421	992	1,480	1,100	615	5,930	2,890	5,070	640
19.....	167	248	892	403	3,380	1,220	1,000	535	4,190	2,410	2,940	565
20.....	164	238	867	385	2,480	1,060	1,000	413	2,480	2,020	2,890	525
21.....	135	213	2,570	416	1,900	975	950	515	2,080	1,900	13,200	484
22.....	136	181	1,420	530	1,660	920	1,000	540	1,840	1,840	22,000	815
23.....	128	168	1,030	488	1,420	1,720	1,200	545	1,540	1,480	23,800	615
24.....	130	133	865	421	1,220	1,720	1,660	590	1,250	2,020	14,400	474
25.....	216	140	765	385	1,060	2,310	1,900	565	1,140	3,280	12,700	425
26.....	145	140	715	399	948	2,280	1,360	615	1,030	2,080	8,860	461
27.....	131	140	892	565	840	1,540	1,140	615	975	2,410	5,630	665
28.....	153	140	1,000	665	765	1,220	975	615	1,110	2,540	3,910	1,200
29.....	181	140	790	690	740	1,080	865	.....	1,300	2,820	2,820	865
30.....	163	140	640	892	815	920	815	.....	1,170	2,220	2,220	715
31.....	164	140	.....	3,710	.....	865	740	.....	1,280	.....	2,020	.....
Mean...	215	221	616	658	1,340	1,390	1,260	575	1,970	3,350	6,550	1,040

NOTE.— Mean discharge, August 26 to 30, estimated, 140 second-feet. Gage heights and discharge, December 1 to 7 and 14 to 16, estimated. Stage-discharge relation affected by ice, January 5 to 23. Discharge estimated by comparing with hydrograph of Genesee river at St. Helena and with hydrograph of sum of Genesee river at St. Helena, Canaseraga creek at Groveland Station and Keashequa creek at Craig Colony, Sonyea.

Monthly discharge of GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS' for the year ended June 30, 1919
[Drainage area, 1,400 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	365	130	215	0.152	0.18
August.....	425	126	221	0.157	0.18
September.....	2,570	140	616	0.437	0.49
October.....	3,710	385	658	0.470	0.54
November.....	3,380	555	1,340	0.956	1.07
December.....	3,100	590	1,390	0.992	1.14
January.....	4,470	740	1,260	0.900	1.04
February.....	1,060	365	575	0.411	0.43
March.....	5,930	975	1,970	1.41	1.63
April.....	15,800	1,030	3,350	2.39	2.67
May.....	23,800	1,300	6,550	4.68	5.40
June.....	2,820	425	1,040	0.743	0.83
The year.....	23,800	126	1,599	1.14	15.60

GENESEE RIVER AT GENESEE JUNCTION

Gage No. 227

This station, established May 14, 1917, is located at the mouth of Black creek, which enters the Genesee river from the west at Genesee Junction, about $5\frac{1}{2}$ miles above the city of Rochester and just above the West Shore railroad bridge over the Genesee river. The gage, No. 227, a standard Type A gage, having a range of 18 feet, between elevations 510.0 and 528.0 (B. C. datum), is secured to the east wing of the north abutment of the Scottsville highway bridge over Black creek. The gage is read once daily—in the morning—to half-tenths.

Daily elevation of water-surface (B. C. datum) of GENESEE RIVER AT GENESEE JUNCTION, for the year ended June 30, 1919. J. Horton Regy, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	510.1	510.85	511.85	511.2	513.65	511.7	509.3	508.4	509.8	509.5	511.15	.....
2.....	510.1	511.0	511.9	511.2	513.8	511.6	509.6	508.3	509.9	509.25	510.9	.....
3.....	510.2	511.15	511.9	511.1	513.85	511.5	509.8	508.3	509.9	509.1	510.55	.....
4.....	510.2	511.4	511.8	511.1	513.85	511.5	509.85	508.0	509.5	509.9	510.0	.....
5.....	510.2	511.45	511.9	511.0	513.75	511.8	509.95	508.0	509.0	509.9	509.8	.....
6.....	510.1	511.5	511.9	511.2	513.4	512.4	509.9	508.0	509.3	509.0	510.5	.....
7.....	510.1	511.8	511.9	511.65	513.15	513.45	509.0	508.0	509.5	509.0	510.6	.....
8.....	510.1	511.9	512.0	511.8	512.85	513.8	509.9	508.0	510.9	509.75	.....	.....
9.....	510.05	511.9	512.0	511.9	512.55	513.8	509.9	508.0	513.5	509.75	.....	.....
10.....	510.05	511.85	512.0	511.8	512.2	513.5	509.75	508.0	513.1	511.1	.....	.....
11.....	510.0	511.65	511.95	511.65	511.95	513.1	509.65	508.0	512.5	513.2	.....	.....
12.....	510.0	511.65	511.9	511.65	511.85	512.8	509.5	508.0	511.85	517.3	.....	.....
13.....	510.0	511.80	511.0	511.85	511.85	513.2	509.4	508.0	510.7	518.15	.....	.....
14.....	510.0	511.9	511.9	511.85	511.8	513.4	509.25	508.0	510.45	516.5	.....	.....
15.....	511.3	512.0	511.95	511.8	511.8	513.8	509.05	508.3	509.45	513.1	.....	.....
16.....	511.5	511.9	512.05	511.8	511.75	513.95	509.05	508.3	509.45	511.1	.....	.....
17.....	511.5	511.9	512.25	511.7	511.85	513.9	509.05	508.5	511.1	512.15	.....	.....
18.....	511.5	511.85	512.25	511.55	511.9	513.1	509.0	508.5	512.5	512.15	.....	.....
19.....	511.4	511.85	512.25	511.4	512.0	512.7	508.85	508.5	513.1	511.7	.....	.....
20.....	511.4	511.8	512.25	511.4	512.15	512.05	508.8	508.5	514.0	511.7	.....	.....
21.....	510.9	511.8	512.8	511.6	512.15	511.7	508.7	508.5	512.5	511.15	.....	.....
22.....	510.15	511.8	512.6	511.8	512.15	511.1	508.7	508.4	510.9	510.8	.....	.....
23.....	510.05	511.8	512.6	511.7	512.05	510.9	508.7	508.7	509.9	510.15	.....	.....
24.....	510.0	511.7	512.3	511.7	512.0	510.8	508.7	508.9	509.65	510.15	.....	.....
25.....	510.0	511.6	512.05	511.6	511.9	510.7	508.5	508.9	509.25	510.3	.....	.....
26.....	510.0	511.55	511.85	511.6	511.9	510.4	508.5	509.2	509.1	510.3	.....	512.0
27.....	510.0	511.5	511.5	511.4	511.75	510.1	508.5	509.4	508.9	510.8	.....	512.4
28.....	510.1	511.65	511.25	511.5	511.75	509.6	508.5	509.6	508.9	510.7	.....	512.4
29.....	510.25	511.75	511.2	511.8	511.75	509.2	508.4	.....	509.0	511.5	.....	512.3
30.....	510.4	511.6	511.2	512.4	511.75	508.8	508.4	.....	509.0	511.5	.....	512.25
31.....	510.65	511.75	.....	513.05	.....	508.7	508.4	.....	509.0	.....	.....	.....

NOTE.—Gage taken down, bridge being repaired, May 8 to June 25.

GENESEE RIVER AT ELMWOOD AVENUE, ROCHESTER

Gage No. 218

Since the establishment of the Gurley automatic gage in December, 1910, reading of the staff gage once daily has been continued. Beginning in 1913, the gage heights from the automatic gage have been published in connection with the discharge, the water-surface elevations being continued as a separate table. In July, 1916, a standard Type A gage, No. 218, having a range of 16 feet, between elevations 507.0 and 523.0, was erected on the north, or downstream end of the east pier of the Elmwood avenue bridge. A standard bench-mark plug was placed in the north end of the same pier at elevation 520.0 (B. C. datum). This gage was read once daily — at 6 P. M. from July 1 to December 21 and at 5 P. M. from December 22 to June 30 — to half-tenths, with occasional hundredths.

Daily elevation of water-surface (B. C. datum) of GENESEE RIVER AT ELMWOOD AVE., ROCHESTER, for the year ended June 30, 1919. P. J. Slavin, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	507.8	507.25	507.25	507.7	509.95	b	506.8	506.0	a	507.0	509.01	508.9
2.....	507.9	507.25	507.2	507.55	507.6	507.5	507.5	a	a	507.0	509.07	508.6
3.....	508.0	507.0	507.25	a	508.35	507.0	509.5	a	506.8	507.5	509.0	508.4
4.....	507.8	507.1	507.2	507.55	508.35	507.45	508.8	a	506.9	507.8	509.0	508.2
5.....	507.9	507.05	507.15	507.2	508.25	507.3	508.0	a	507.7	507.8	509.0	508.1
6.....	507.9	507.2	507.2	507.35	508.85	507.2	507.5	a	507.8	507.8	508.8	508.0
7.....	507.9	507.3	507.15	507.3	508.35	507.35	507.2	a	506.9	507.9	509.5	508.0
8.....	507.8	507.6	507.15	507.7	507.8	507.7	507.0	a	506.8	508.0	509.8	507.8
9.....	507.8	507.6	507.2	507.75	507.8	508.15	507.0	a	507.2	508.0	510.6	a
10.....	507.85	507.5	507.25	507.65	507.8	509.35	507.0	a	510.8	508.0	512.4	510.0
11.....	507.85	507.1	507.15	507.45	507.35	507.85	507.0	a	510.4	509.8	514.5	509.5
12.....	507.85	507.2	507.1	507.3	507.55	508.0	507.0	a	509.5	514.3	515.5	508.5
13.....	507.85	507.3	a	507.3	507.65	508.0	507.0	a	509.0	512.6	515.5	508.2
14.....	507.85	507.6	a	507.3	507.35	508.1	507.0	a	508.0	511.5	514.0	507.9
15.....	507.85	507.6	507.0	507.2	507.45	508.7	507.0	a	507.2	509.4	511.5	507.6
16.....	507.9	507.4	507.1	507.4	507.3	509.35	507.0	a	507.0	510.6	510.6	507.6
17.....	507.8	507.4	507.0	507.35	507.2	508.65	507.0	a	508.0	510.1	510.4	507.6
18.....	507.85	507.3	507.1	507.3	507.25	508.45	507.0	a	510.4	509.8	510.2	507.4
19.....	507.85	507.35	508.05	507.15	508.1	508.35	507.0	a	511.4	509.4	510.8	507.4
20.....	507.85	507.3	507.65	507.2	509.35	508.0	506.8	a	511.0	508.8	511.6	507.2
21.....	507.75	507.3	508.1	507.2	508.7	507.5	506.4	a	510.2	508.4	513.5	507.1
22.....	507.65	507.25	508.7	507.15	508.4	506.5	506.4	a	508.5	508.0	514.8	507.1
23.....	507.75	507.2	508.35	507.25	508.35	506.5	506.4	a	508.0	508.0	516.1	507.0
24.....	507.8	507.1	507.9	507.2	508.25	507.6	506.4	a	507.8	508.0	517.5	507.0
25.....	507.65	507.1	507.8	507.2	508.0	507.6	506.4	a	507.4	509.6	517.2	507.0
26.....	507.75	507.1	507.8	507.25	507.75	507.6	506.2	a	507.0	509.09	518.2	507.1
27.....	507.5	506.45	507.8	507.2	507.7	507.6	506.2	a	507.0	509.05	514.5	507.3
28.....	507.5	507.15	507.9	507.3	507.35	507.6	506.2	a	507.0	509.75	510.9	507.2
29.....	507.65	507.1	508.05	507.55	507.55	506.9	506.0	.....	507.0	509.09	510.4	507.0
30.....	507.3	507.0	507.9	507.55	507.55	506.9	506.0	.....	507.5	509.08	509.6	507.0
31.....	507.35	507.1	.....	507.7	.....	506.9	506.0	.....	507.5	.....	509.4	.....

a No record.

b Reading doubtful..

GENESEE RIVER AT ROCHESTER

Location.—At the Elmwood avenue bridge at the north end of Genesee Valley park, $3\frac{1}{4}$ miles below the mouth of Black creek, $3\frac{1}{2}$ miles above the center of the city of Rochester, Monroe county, and $7\frac{1}{2}$ miles above the mouth of the river.

Drainage area.—2,440* square miles.

Records available.—Discharge records, February 9, 1904, to September 30, 1918. Fragmentary records prior to this period published in Water-Supply Papers Nos. 24, 65 and 97. Gage-height records, October 1 to 10, 1918, and March 3 to June 7, 1919. Rating does not apply for these periods on account of Barge canal construction in progress in river channel.

Gage.—Gurley water-stage recorder installed in December, 1910, in the pump-house immediately below the bridge on the right bank. Recorder inspected by Geo. A. Bailey. Prior to December, 1910, a staff gage bolted to the downstream end of the first pier from the right abutment. Elevation of zero of gage, 506.848 (B. C. datum) or 245.591, Rochester city datum. Record suspended October 11, 1918, on account of dredging operations in river channel.

Vertical enameled staff gage installed March 3, 1919, above site of temporary dam, giving elevations referred to Barge canal datum; record obtained March 3 to June 7, 1919. Gage read by J. Bendon.

Discharge measurements.—Made from downstream side of Elmwood avenue bridge.

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 2,360 square miles.

NOTE.—Due to Barge canal construction, discharge records ceased September 30, 1918, and the station was officially discontinued. Gage heights obtained after that date cannot be applied to rating table to give accurate estimates of discharge.

Discharge measurements of GENESEE RIVER AT ROCHESTER, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 12.....	E. D. Burchard.....	1.14	764
July 20.....	E. D. Burchard.....	1.20	875
July 27.....	E. D. Burchard.....	0.76	664
July 31.....	E. D. Burchard.....	0.60	666
Aug. 19.....	E. D. Burchard.....	0.49	597
Aug. 26.....	E. D. Burchard.....	0.40	512
Sept. 24.....	E. D. Burchard.....	1.21	1,580
Oct. 5.....	E. D. Burchard.....	0.77	1,050
Nov. 9.....	E. D. Burchard.....	1.07	1,540
1919			
Mar. 3.....	E. D. Burchard.....	a 508.61	2,300
Mar. 4.....	E. D. Burchard.....	a 508.37	1,830
April 5.....	J. W. Moulton.....	a 508.34	1,740
April 7.....	J. W. Moulton.....	a 508.58	2,240
April 8.....	J. W. Moulton.....	a 508.60	2,210
April 15.....	C. C. Covert.....	a 510.79	5,830
April 16.....	J. W. Moulton.....	a 509.86	4,130
April 17.....	J. W. Moulton.....	a 510.52	5,390
May 14 b.....	J. W. Moulton.....	a 514.6	16,100

a Barge canal datum. b Debris on control.

Daily gage height, in feet, of GENESEE RIVER AT ROCHESTER, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1.....	1.14	0.42	0.41	11.....	1.17	0.42	0.41	21.....	1.03	0.43	1.25
2.....	1.20	0.42	0.41	12.....	1.14	0.43	0.41	22.....	0.69	0.43	2.03
3.....	1.21	0.42	0.41	13.....	1.17	0.42	0.41	23.....	0.84	0.41	1.61
4.....	1.23	0.42	0.41	14.....	1.11	0.42	0.41	24.....	1.04	0.41	1.33
5.....	1.23	0.43	0.41	15.....	1.17	0.65	0.41	25.....	1.00	0.41	1.11
6.....	1.25	0.45	0.41	16.....	1.23	0.61	0.41	26.....	0.97	0.41	1.04
7.....	1.19	0.78	0.41	17.....	1.17	0.56	0.41	27.....	0.74	0.41	0.99
8.....	1.08	0.95	0.41	18.....	1.18	0.54	0.5	28.....	0.71	0.41	1.15
9.....	1.11	0.88	0.41	19.....	1.18	0.50	1.26	29.....	0.94	0.41	1.31
10.....	1.18	0.56	0.41	20.....	1.09	0.48	1.02	30.....	0.60	0.41	1.14
								31.....	0.58	0.41	

Daily discharge, in second-feet, of GENESEE RIVER AT ROCHESTER, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1.....	750	460	550	11.....	800	500	550	21.....	550	550	1,600
2.....	850	480	550	12.....	750	500	550	22.....	300	550	2,800
3.....	850	480	550	13.....	800	500	550	23.....	480	500	2,200
4.....	850	480	550	14.....	700	500	550	24.....	750	500	1,800
5.....	850	480	550	15.....	750	750	550	25.....	800	500	1,400
6.....	900	500	550	16.....	800	700	550	26.....	800	500	1,400
7.....	800	900	550	17.....	700	650	550	27.....	650	550	1,300
8.....	700	1,100	550	18.....	700	650	700	28.....	650	550	1,500
9.....	750	1,000	550	19.....	650	600	1,600	29.....	950	550	1,800
10.....	800	650	550	20.....	550	600	1,300	30.....	600	550	1,500
								31.....	650	550	

NOTE.— Discharge, July 1 to September 30, determined by indirect method on account of dredging operations on the control.

Monthly discharge of GENESEE RIVER AT ROCHESTER, for the year ended June 30,
1919
[Drainage area, 2,440 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	950	300	725	0.297	0.34
August.....	1,100	460	591	0.242	0.28
September.....	2,800	550	1,010	0.414	0.46

Daily gage height, in feet, of GENESEE RIVER AT ROCHESTER, for the year ended
June 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.98						508.40	509.20	509.32
2.....	0.84						508.27	508.83	509.20
3.....	0.55					508.69	508.20	508.93	508.67
4.....	0.55					508.25	508.18	508.78	508.52
5.....	0.60					508.17	508.17	509.00	509.15
6.....	0.56					508.33	508.47	508.57	510.45
7.....	0.51					508.47	508.58	509.03	511.47
8.....	0.89					508.18	508.60	508.83	
9.....	1.05					508.55	508.65	508.72	
10.....	0.86					510.80	509.83	510.03	
11.....						510.73	512.77	516.65	
12.....						509.90	514.60	519.17	
13.....						509.17	514.47	520.4	
14.....						508.90	512.20	518.87	
15.....						508.32	510.53	515.23	
16.....						508.33	509.83	513.20	
17.....						509.15	510.48	511.57	
18.....						511.37	510.13	511.70	
19.....						511.45	509.45	512.93	
20.....						510.10	509.12	511.23	
21.....						509.17	508.85	513.97	
22.....						508.83	508.73	517.22	
23.....						508.65	508.63	520.00	
24.....						508.47	508.43	520.70	
25.....						508.15	509.23	520.92	
26.....						508.20	509.35	519.15	
27.....						508.13	509.42	516.95	
28.....						508.23	509.73	513.50	
29.....						508.23	509.83	511.10	
30.....						508.32	509.78	509.72	
31.....						508.30		509.62	

NOTE.— Gage height readings, October 1 to 10 (zero of gage, 506.848, B. C. datum). Water-surface elevations (B. C. datum), March 3 to June 7.

CANASERAGA CREEK

DESCRIPTION

Canaseraga creek, one of the most important tributaries to the Genesee river from the east, rises in the extreme northwestern corner of Steuben county and flows in a northwesterly direction to its junction with the Genesee river, a short distance below the village of Mount Morris.

Through its entire course the creek flows through a flat, fertile valley, devoted almost entirely to the pursuit of agriculture. From the village of Dansville to Mount Morris, the natural bed of the river originally wound back and forth across the valley. The velocity was so slow that the large amount of silt which was brought down from the foot hills by the smaller streams was deposited in the creek bed, raising it to an elevation higher, in many cases, than the surrounding country. The deposit of silt, coupled with the extreme deviation of the creek from a straight line caused the 11,000 acres, which border on the stream below Dansville, to become annually inundated by the flood waters.

During 1911 to 1915, inclusive, the channel was deepened, straightened, confined in part by levees, and the length of flow materially reduced from Cumminsville bridge, a mile north or downstream from the Dansville gaging station, to Shakers Crossing, about a mile above the junction with the Genesee river.

CANASERAGA CREEK NEAR DANSVILLE

Location.—At highway bridge 1 mile west of Dansville, Livingston county, 2,200 feet below mouth of Mill brook and about 22 miles above mouth of creek.

Drainage area.—158 square miles, as determined by engineers of the State Conservation Commission. Formerly given as 167 square miles.

Records available.—July 21, 1910, to December 31, 1912; July 10, 1915, to June 30, 1917; March 10, 1919, to June 17, 1919, when the station was discontinued.

Gage.—Vertical staff at downstream side of left abutment. Gage read by C. W. Maloney.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Sand and gravel; shifting frequently.

Extremes of discharge.—Current year: Maximum stage recorded, 12 feet at 8 A. M., May 22; discharge, 3,500 second-feet. Minimum stage recorded, 6.2 feet several times in March; discharge, 120 second-feet.

1910–1912, 1915–1917, and 1919: Maximum stage recorded, 13.0 feet at 9.30 P. M., May 16, 1916; discharge, determined roughly from logarithmic extension of rating curve, 6,600 second-feet. Minimum stage recorded, 5.2 feet several times during October and November, 1916.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Rating curve not well defined. Gage read to half-tenths twice daily.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of CANASERAGA CREEK NEAR DANSVILLE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
April 12.....	J. W. Moulton.....	8.04	943
April 12.....	J. W. Moulton.....	7.82	837
April 15.....	J. W. Moulton.....	6.70	262
May 13.....	J. W. Moulton.....	7.48	595
May 23.....	C. C. Covert.....	9.08	1,610
May 27.....	J. W. Moulton.....	7.42	462
June 12.....	J. W. Moulton.....	6.68	135

Daily discharge, in second-feet, of CANASERAGA CREEK NEAR DANSVILLE, for the year ended June 30, 1919

DAY	Mar.	April	May	June	DAY	Mar.	April	May	June
1.....		155	260	162	16.....	240	280	290	98
2.....		180	210	162	17.....	450	240	476	
3.....		139	175	148	18.....	586	210	340	
4.....		210	* 178	122	19.....	320	180	240	
5.....		260	180	* 122	20.....	210	155	280	
6.....		210	151	122	21.....	180	160	1,490	
7.....		210	145	193	22.....	168	139	* 2,630	
8.....		180	139	134	23.....	135	132	1,710	
9.....		280	210	592	24.....	131	360	1,620	
10.....	320	792	2,070	483	25.....	119	280	856	
11.....	240	1,400	1,680	162	26.....	115	210	536	
12.....	195	930	930	122	27.....	115	210	410	
13.....	155	450	614	122	28.....	119	240	301	
14.....	135	340	403	87	29.....	125	340	263	
15.....	135	260	320	98	30.....	131	280	227	
					31.....	151		193	

* Estimated by comparison with discharge at Cumminsville.

Monthly discharge of CANASERAGA CREEK NEAR DANSVILLE, for the year ended
June 30, 1919

[Drainage area, 168 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
April.....	1,400	132	314	1.99	2.22
May.....	2,680	139	630	3.99	4.60

CANASERAGA CREEK AT CUMMINSVILLE

Location.—At bridge on State road in village of Cummins-ville, Livingston county, about one mile downstream from station formerly maintained as "Canaseraga Creek near Dansville," about 1½ miles below Mill Brook and 21 miles above mouth of creek.

Drainage area.—160* square miles. (Measured by State Conservation Commission.)

Records available.—October 23, 1917, to June 30, 1919, at this station; at station near Dansville, July 21, 1910, to December 31, 1912, and July 10, 1915, to December 29, 1917.

Gage.—Vertical staff, in three sections, on downstream face of bridge pier, graduated from 0 to 10.0. Read by George Freed.

Discharge measurements.—Made by wading below control at low and medium stages and from downstream side of bridge during high water.

Channel and control.—Rather well compacted gravel and small boulders; practically permanent between dates of shift, but liable to shift during severe floods.

Extremes of discharge.—Current year: Maximum stage recorded, 6.8 feet at 8:30 A. M., May 22; discharge, 6,540 second-feet. Minimum stage recorded, 0.70 foot several times in August and September, 1918; discharge, 21 second-feet.

1917-1919: Maximum stage recorded, 6.8 feet at 8:30 A. M., May 22, 1919; discharge, 6,540 second-feet. Minimum stage recorded, 0.70 foot several days in August and September, 1918; discharge, 21 second-feet.

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 171 square miles.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation probably permanent between dates of shift. Affected by ice during a large part of the period from December to March. Gage read to tenths twice daily.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of CANASERAGA CREEK AT CUMMINSVILLE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 15.....	E. D. Burchard.....	0.89	88.2
Aug. 23.....	E. D. Burchard.....	0.77	24.7
1919			
Jan. 25.....	E. D. Burchard.....	1.07	61.0
Mar. 31.....	J. W. Moulton.....	1.39	138
June 13.....	J. W. Moulton.....	1.17	116
June 13.....	J. W. Moulton.....	1.16	121
June 23.....	J. W. Moulton.....	1.00	80.6

Daily gage height, in feet, of CANASERAGA CREEK AT CUMMINSVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.90	0.90	0.70	0.90	1.05	0.80	1.20	1.00	2.15	1.30	1.50	1.40
2.....	0.90	0.90	0.70	0.90	0.90	0.80	2.00	1.10	1.70	1.30	1.49	1.30
3.....	0.85	0.90	0.70	0.85	0.90	0.80	1.50	1.00	1.55	1.35	1.48	1.30
4.....	0.80	0.80	0.70	0.80	0.90	0.80	1.00	0.90	1.40	1.60	1.49	1.20
5.....	0.80	0.85	0.75	0.80	0.90	0.80	1.00	0.90	1.40	1.61	1.47	1.20
6.....	0.80	0.80	0.80	0.90	0.90	0.80	1.00	0.90	1.30	1.61	1.40	1.20
7.....	0.80	0.80	0.80	0.90	0.90	0.90	1.00	0.90	1.30	1.58	1.38	1.20
8.....	0.80	0.80	0.80	0.90	0.90	1.10	1.00	0.80	1.30	1.48	1.35	1.29
9.....	0.85	0.80	0.80	0.90	0.90	1.50	1.10	0.90	1.95	1.78	1.31	1.90
10.....	1.00	0.80	0.80	0.90	0.90	1.20	1.25	0.90	1.70	2.8	3.2	1.74
11.....	1.00	1.00	0.80	0.80	0.90	1.00	1.30	0.85	1.60	3.2	2.9	1.55
12.....	0.90	0.95	0.80	0.80	0.90	1.00	1.20	0.80	1.50	2.8	2.5	1.41
13.....	0.90	0.80	0.90	0.90	0.85	0.90	1.20	0.80	1.40	2.3	2.1	1.25
14.....	0.90	0.80	0.80	0.90	0.80	0.90	1.35	0.90	1.40	1.80	1.75	1.16
15.....	0.90	0.80	0.80	0.90	0.80	0.95	1.30	0.90	1.40	1.61	1.59	1.10
16.....	0.90	0.80	0.90	0.80	0.80	1.00	1.20	0.90	1.40	1.68	1.59	1.10
17.....	0.85	0.80	1.00	0.80	0.85	0.90	1.20	0.90	1.40	1.64	1.61	1.08
18.....	0.90	0.80	0.90	0.80	1.55	0.90	1.20	0.85	1.35	1.5	1.52	1.15
19.....	0.90	0.80	0.80	0.80	1.45	0.90	1.10	0.80	1.40	1.43	1.46	1.09
20.....	0.90	0.80	1.40	0.80	1.30	0.90	1.10	0.85	1.40	1.40	1.42	1.07
21.....	0.80	0.70	1.10	0.90	1.20	0.90	1.10	0.90	1.35	1.41	3.3	1.00
22.....	0.80	0.70	0.95	0.85	1.20	0.90	1.10	0.90	1.30	1.38	4.8	1.00
23.....	0.80	0.70	0.90	0.80	1.00	1.25	1.10	1.00	1.30	1.30	3.4	1.00
24.....	0.80	0.70	0.90	0.80	1.00	1.35	1.00	1.00	1.30	2.0	2.9	1.00
25.....	1.00	0.70	0.90	0.80	1.00	1.25	0.95	1.00	1.32	1.75	2.6	0.96
26.....	0.95	0.70	0.90	0.80	0.90	1.30	0.90	1.00	1.32	1.60	2.35	1.10
27.....	0.90	0.70	0.90	0.80	0.90	1.20	0.90	1.00	1.24	1.65	1.90	1.45
28.....	0.90	0.70	0.90	0.80	0.90	1.20	0.90	1.00	1.25	1.61	1.68	1.25
29.....	0.90	0.70	0.90	0.80	0.90	1.20	0.90	.....	1.23	1.66	1.60	1.15
30.....	1.00	0.70	0.90	0.85	0.90	1.15	0.90	.....	1.29	1.57	1.52	1.05
31.....	0.90	0.80	.....	1.35	.....	1.10	0.90	.....	1.41	.....	1.47	.....

Daily discharge, in second-feet, of CANASERAGA CREEK AT CUMMINSVILLE, for the year ended June 30, 1918

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		324	82	140	40	520	153	71	116
2.		286	82	140	34	491	153	68	90
3.		222	82	200	34	462	153	66	66
4.		196	86	140	40	378	145	66	66
5.		201	84	120	40	406	122	66	66
6.		196	82	120	34	645	122	66	66
7.		184	82	90	46	434	138	63	66
8.		141	80	55	40	491	157	122	66
9.		141	100	55	40	406	157	90	66
10.		130	85	65	40	1,080	130	116	66
11.		126	85	55	120	434	116	142	58
12.		123	80	100	700	925	119	122	161
13.		116	75	90	650	815	142	122	106
14.		110	110	55	580	2,190	350	122	90
15.		113	90	55	1,170	815	491	100	66
16.		104	85	55	462	406	406	90	49
17.		104	85	45	294	378	294	76	49
18.		104	85	30	294	245	434	76	49
19.		107	160	34	1,080	245	305	73	36
20.		95	150	40	2,080	265	224	103	36
21.		89	116	38	350	279	289	122	36
22.		107	116	40	294	367	241	122	49
23.		110	110	40	294	279	173	122	49
24.		101	126	40	294	224	153	161	49
25.		92	172	55	322	165	153	138	49
26.		86	150	46	1,130	130	122	122	42
27.		86	190	40	678	126	109	122	36
28.		853	86	140	32	350	122	90	112
29.		1,060	82	160	30	.....	145	90	122
30.		1,060	82	190	34	.....	145	80	138
31.		658	160	40	.....	153	.....	122	.....
Mean		135	112	68.4	412	457	194	104	61.7

Daily discharge, in second-feet, of CANASERAGA CREEK AT CUMMINSVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	36	36	21	36	58	27	90	49	550	122	202	207
2.	36	36	21	36	36	27	460	66	294	122	198	165
3.	32	36	21	32	36	27	202	49	224	142	194	165
4.	27	27	21	27	36	27	49	36	161	245	194	128
5.	27	32	24	27	36	27	49	36	161	250	190	128
6.	27	27	27	36	36	27	49	36	122	260	161	128
7.	27	27	27	36	36	36	49	36	122	236	153	128
8.	27	27	27	36	36	66	49	27	122	194	142	161
9.	32	27	27	36	36	202	66	36	430	339	126	470
10.	49	27	27	36	36	90	106	36	294	1,000	1,350	378
11.	49	49	27	27	36	49	122	32	245	1,350	1,080	278
12.	36	42	27	27	36	49	90	27	202	1,000	780	212
13.	36	27	36	36	32	36	90	27	161	645	520	146
14.	36	27	27	36	36	27	36	142	36	350	322	115
15.	36	27	27	36	27	42	122	36	161	250	241	96

Daily discharge, in second-feet, of CANASERAGA CREEK AT CUMMINSVILLE, for the year ended June 30, 1919—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.....	36	27	36	27	27	49	90	36	200	284	241	96
17.....	32	27	49	27	32	36	90	36	400	265	250	91
18.....	36	27	36	27	224	36	90	32	580	202	211	112
19.....	36	27	27	27	182	36	66	27	350	173	186	94
20.....	30	27	161	27	122	36	66	32	220	161	169	88
21.....	27	21	66	36	90	36	66	36	160	16	1,450	71
22.....	27	21	47	32	90	36	66	36	122	153	3,210	71
23.....	27	21	36	27	49	106	66	49	122	122	1,550	71
24.....	27	21	36	27	49	142	49	49	122	460	1,190	71
25.....	49	21	36	27	49	106	42	49	130	322	940	65
26.....	42	21	36	27	36	122	36	49	130	245	755	96
27.....	36	21	36	27	36	90	36	49	103	270	470	230
28.....	36	21	36	27	36	90	36	49	106	250	345	146
29.....	36	21	36	27	36	90	36	.....	100	274	303	112
30.....	46	21	36	32	36	78	36	.....	119	232	263	84
31.....	36	27	.....	142	.....	66	36	.....	165	.....	239	.....
Mean...	34.9	27.3	36.4	34.4	54.5	62.0	85.2	39.1	211	336	569	147

NOTE.—Discharge estimated, March 16 to 21, on basis of discharge of Canaseraga creek at Dansville and at Groveland Station.

Monthly discharge of CANASERAGA CREEK AT CUMMINSVILLE, for the 20 months ended June 30, 1919

[Drainage area, 160 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
November.....	324	82	135	0.844	0.94
December.....	190	75	112	0.700	0.81
January.....	200	30	68.4	0.428	0.43
February.....	2,080	34	412	2.58	2.69
March.....	2,190	122	457	2.86	3.30
April.....	491	80	194	1.21	1.35
May.....	161	63	104	0.650	0.75
June.....	161	36	61.7	0.386	0.43
July.....	49	27	34.9	0.204	0.24
August.....	49	21	27.3	0.154	0.18
September.....	161	21	36.4	0.213	0.24
October.....	142	27	34.4	0.215	0.25
November.....	224	27	54.5	0.341	0.38
December.....	202	27	62.0	0.388	0.45
January.....	460	36	85.2	0.532	0.61
February.....	66	27	39.1	0.244	0.25
March.....	580	100	211	1.32	1.52
April.....	1,350	122	336	2.10	2.34
May.....	3,210	128	569	3.56	4.10
June.....	470	65	147	0.919	1.03
The year.....	3,210	21	136	0.85	11.59

CANASERAGA CREEK AT GROVELAND STATION

Location.—At highway bridge at Groveland Station, Livingston county.

Drainage area.—184* square miles. Measured by engineers of the New York State Conservation Commission.

Records available.—August 5, 1915, to September 30, 1916; March 1, 1917, to June 30, 1919.

Gage.—Chain gage near center of downstream side of bridge. Prior to March 30, 1916, inclined staff on right bank about 400 feet above bridge, at practically same datum, 560.00 (Conservation Commission datum); read by Thomas Maimone.

Discharge measurements.—Made from highway bridge or by wading.

Channel and control.—Creek flows through improved channel, which is in gravel and is likely to shift.

Extremes of discharge.—Maximum stage recorded during fifteen month period, 18.05 feet at 9:20 A. M., May 22; discharge, 4,380 second-feet. Minimum stage recorded, 6.3 feet several times in August and November, 1918; discharge, 19 second-feet.

1915–1919: Maximum stage recorded, May 22, 1919; discharge, 4,380 second-feet. Minimum stage recorded, 6.3 feet in August and November, 1918; discharge, 19 second-feet.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation permanent; usually affected by ice, December to March. Rating curve well defined between 35 and 3,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for floods of several days' duration, when stage-discharge relation may be affected by backwater.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 195 square miles.

REPORT OF STATE ENGINEER

Discharge measurements of CANASERAGA CREEK AT GROVELAND STATION, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 15.....	E. D. Burchard.....	6.64	36
Aug. 24.....	E. D. Burchard.....	6.52	29
1919			
Jan. 25.....	E. D. Burchard.....	7.32	102
Mar. 31.....	J. W. Moulton.....	7.80	167
Apr. 12.....	J. W. Moulton.....	12.23	1,020
Apr. 12.....	J. W. Moulton.....	11.62	893
Apr. 13.....	J. W. Moulton.....	10.01	557
May 13.....	O. W. Hartwell.....	10.71	680
May 23.....	O. W. Hartwell.....	13.76	1,610
May 24.....	O. W. Hartwell.....	12.80	1,190
May 25.....	J. W. Moulton.....	12.27	1,080
May 26.....	J. W. Moulton.....	10.55	649
May 27.....	J. W. Moulton.....	9.84	510
June 11.....	J. W. Moulton.....	8.16	192
June 23.....	J. W. Moulton.....	7.19	82

Daily gage height, in feet, of CANASERAGA CREEK AT GROVELAND STATION, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	6.8	6.6	6.35	6.68	8.0	6.80	8.0	6.88	9.4	7.7	8.5	8.2
2.....	6.7	6.6	6.42	6.60	7.6	6.98	8.9	7.05	7.6	7.55	8.5	8.1
3.....	6.7	6.6	6.42	6.72	7.35	6.88	7.85	6.82	7.4	7.95	8.3	8.0
4.....	a	6.65	6.48	6.62	7.3	6.8	7.4	7.0	7.4	8.5	8.1	7.85
5.....	a	6.6	6.7	6.60	7.35	6.85	7.25	6.90	7.5	8.3	8.0	7.7
6.....	6.65	6.55	6.7	7.0	7.3	6.98	7.4	6.85	7.6	8.0	7.9	7.95
7.....	6.65	6.5	a	7.2	7.4	a	7.5	6.98	7.65	8.2	7.8	8.5
8.....	6.7	6.5	a	7.0	7.35	6.98	7.55	7.02	7.7	8.0	7.8	8.8
9.....	6.9	7.1	a	6.88	7.0	8.4	7.45	6.88	a	8.6	7.8	9.9
10.....	7.15	6.6	a	6.78	6.85	7.9	7.05	6.85	9.1	11.4	13.9	8.7
11.....	6.9	6.6	a	6.68	6.60	7.8	7.2	6.78	8.6	13.5	14.0	8.2
12.....	6.8	6.6	a	6.62	6.35	7.6	7.35	a	8.1	12.4	12.2	7.9
13.....	6.7	6.6	a	6.62	a	7.4	7.6	a	8.2	9.3	10.6	7.7
14.....	6.65	6.6	a	6.58	a	8.1	7.6	a	7.4	a	9.6	7.4
15.....	6.65	6.5	a	6.52	a	8.7	7.9	a	7.55	a	9.0	7.5
16.....	6.6	6.5	a	6.58	6.32	8.0	7.6	6.90	8.0	a	8.7	7.5
17.....	6.75	6.42	a	6.62	6.70	7.65	7.6	6.90	9.7	a	10.1	7.8
18.....	6.8	6.45	6.7	6.58	7.8	7.4	7.4	6.92	10.2	a	9.1	7.5
19.....	6.6	6.48	7.25	6.65	8.3	7.3	7.3	7.1	9.2	a	8.6	7.3
20.....	6.5	6.32	7.8	a	7.7	7.7	7.35	7.15	9.0	8.2	9.0	7.4
21.....	6.55	6.5	7.15	a	7.6	7.1	7.2	6.88	7.9	8.0	14.4	7.3
22.....	6.55	6.5	6.9	a	7.4	7.05	7.1	6.88	7.6	7.9	15.8	7.25
23.....	6.55	6.5	6.8	a	7.2	7.65	7.4	7.0	7.5	7.65	14.4	7.2
24.....	6.7	6.48	6.8	a	7.0	a	8.0	6.92	7.4	9.7	13.2	7.2
25.....	7.1	6.48	6.7	a	7.1	a	7.4	6.82	7.3	8.6	12.0	7.7
26.....	6.8	6.45	6.75	a	6.98	a	7.35	6.78	7.3	8.5	10.7	7.9
27.....	6.7	6.48	6.8	a	6.92	a	7.4	6.88	7.4	8.7	9.9	7.5
28.....	6.6	6.38	6.75	a	6.82	a	7.1	7.05	7.5	8.8	9.3	a
29.....	6.6	6.38	6.7	a	6.82	7.3	7.1	.....	7.6	9.1	9.1	7.3
30.....	6.7	6.32	6.7	a	6.92	7.3	7.1	.....	7.6	8.6	8.8	7.1
31.....	6.6	6.38	.....	8.9	.....	7.4	6.88	.....	7.75	.....	8.4	.....

a No record.

Daily discharge, in second-feet, of CANASERAGA CREEK AT GROVELAND STATION, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	42	32	24	39	196	48	196	54	429	152	275	227
2.....	40	32	26	33	138	63	341	70	138	132	275	211
3.....	38	32	26	42	106	54	174	50	112	188	243	196
4.....	38	34	28	34	100	48	112	65	112	275	211	174
5.....	36	32	36	33	106	52	94	56	125	243	196	152
6.....	36	30	36	65	100	63	112	52	138	196	181	188
7.....	36	28	36	88	112	63	125	63	145	227	166	275
8.....	36	28	36	65	106	63	132	67	152	196	166	324
9.....	48	60	36	54	65	259	118	54	500	291	166	525
10.....	70	32	36	46	52	181	70	52	375	835	1,680	307
11.....	50	32	36	39	33	166	88	46	291	1,480	1,740	227
12.....	42	32	26	34	25	138	106	50	211	1,060	1,020	181
13.....	38	32	36	34	25	112	138	48	227	411	660	152
14.....	36	28	36	32	25	211	138	60	112	370	466	112
15.....	36	28	36	29	25	307	181	90	132	300	358	125
16.....	34	28	36	32	25	196	138	56	196	340	307	125
17.....	40	26	36	34	40	145	138	58	455	300	560	166
18.....	42	26	36	32	166	112	112	58	580	240	375	125
19.....	36	28	80	36	243	100	100	76	393	210	291	100
20.....	32	22	150	35	152	88	106	82	358	227	358	112
21.....	32	28	65	40	138	76	88	54	181	196	1,950	100
22.....	32	28	46	40	112	70	76	54	138	181	2,790	94
23.....	32	28	40	45	88	145	112	65	125	145	1,950	88
24.....	40	28	40	45	65	240	196	68	112	485	1,350	88
25.....	65	28	36	45	76	340	112	50	100	291	970	152
26.....	42	26	38	45	63	180	106	46	100	275	680	181
27.....	36	26	40	45	58	140	112	54	112	307	525	125
28.....	34	24	38	50	50	110	76	70	125	324	411	112
29.....	34	24	36	115	50	100	76	.....	138	375	375	100
30.....	40	22	36	250	58	100	76	.....	138	291	324	76
31.....	36	24	.....	341	.....	112	54	.....	159	.....	259	.....
Mean...	39.6	29.4	41.8	61.2	86.6	132	123	59.1	214	351	686	171

NOTE.—Mean discharge, September 7 to 17, estimated, 36 second-feet. Discharge estimated on basis of discharge of Canaseraga creek at Cumminsville for the following dates: October 20 to 30, November 12 to 16, December 7, 24 to 28, February 12 to 15, March 9 and April 14 to 19. Stage-discharge relation not affected by ice.

Monthly discharge of CANASERAGA CREEK, AT GROVELAND STATION, for the year ended June 30, 1919

[Drainage area, 184 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	70	32	39.6	0.203	0.23
August.....	60	22	29.4	0.151	0.17
September.....	150	24	41.8	0.214	0.24
October.....	341	29	61.2	0.333	0.38
November.....	243	25	86.6	0.471	0.53
December.....	340	48	132	0.718	0.83
January.....	341	54	123	0.668	0.77
February.....	90	46	59.1	0.321	0.33
March.....	580	100	214	1.16	1.34
April.....	1,480	132	351	1.90	2.12
May.....	2,790	166	686	3.73	4.30
June.....	525	76	171	0.930	1.04
The year.....	2,790	22	166	0.90	12.28

CANASERAGA CREEK AT SHAKERS CROSSING, NEAR MOUNT MORRIS

Location.—At highway bridge at Shakers Crossing, about 1 mile above mouth and $1\frac{1}{4}$ miles northeast of Mount Morris, Livingston county.

Drainage area.—335* square miles. (Measured by engineers of the State Conservation Commission.)

Records available.—Occasional current-meter measurements, 1904 to 1915; continuous record of gage height and occasional current-meter measurements, July 13, 1915, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder, on the left bank, just below the bridge. Datum of gage same as that for gage on Genesee river at Jones bridge near Mount Morris, established July 12, 1915, 540.00 (Conservation Commission datum). Recorder inspected by Mrs. Wm. Russell.

Discharge measurements.—Made from the highway bridge during medium and high stages and by wading during low stages.

Channel and control.—Firm gravel; not likely to shift; subject to backwater from Genesee river.

Extremes of stage.—Current year: Maximum stage from water-stage recorder, 27.2 feet at 3 A. M., May 23. Minimum stage from water-stage recorder, 7.86 feet at 6 P. M., August 31.

1915–1919: Maximum stage from water-stage recorder, 28.92 feet at 1 P. M., May 17, 1916. Minimum stage from water-stage recorder, 7.86 feet at 6 P. M., August 31, 1918.

Ice.—Stage-discharge relation affected by ice.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Data on extent and duration of backwater from Genesee river too meager to permit accurate determination of discharge.

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 347 square miles.

Discharge measurements of CANASERAGA CREEK AT SHAKERS CROSSING, NEAR MOUNT MORRIS, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 15.....	E. D. Burchard.....	8.70	157
1919			
Mar. 4.....	E. D. Burchard.....	9.19	256
Apr. 1.....	J. W. Moulton.....	9.38	301
Apr. 14.....	J. W. Moulton.....	12.87	1,100
Apr. 16.....	J. W. Moulton.....	11.30	719
May 13 a.....	J. W. Moulton.....	17.22	3,180
May 23 a.....	C. S. De Golyer.....	16.88	6,360
May 26.....	J. W. Moulton.....	19.18	8,720
June 13.....	J. W. Moulton.....	9.32	316

a Considerable backwater from Genesee river.

Daily gage height, in feet, of CANASERAGA CREEK AT SHAKERS CROSSING, NEAR MOUNT MORRIS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	8.63	8.22	8.29	8.64	10.98	8.80	9.06	8.76	9.75	9.45	10.07	9.83
2.....	8.61	8.18	8.29	8.64	.....	8.76	12.36	8.84	9.75	9.37	10.15	9.41
3.....	8.54	8.16	8.23	8.64	.....	8.76	10.25	9.00	9.12	9.49	9.80	9.59
4.....	8.40	8.00	8.26	8.65	.....	8.81	9.18	8.94	9.14	9.83	9.53	9.46
5.....	8.52	8.20	8.18	8.50	.....	8.93	9.59	8.80	9.30	10.21	9.87	9.45
6.....	8.41	8.32	8.35	8.90	.....	8.94	9.85	8.75	9.47	10.03	9.72	9.49
7.....	8.42	8.26	8.36	9.27	.....	9.00	9.46	8.85	9.26	9.94	9.47	10.13
8.....	8.46	8.20	8.49	9.11	.....	9.06	9.34	8.84	9.33	9.81	9.43	9.84
9.....	8.37	8.36	8.48	8.99	.....	10.94	9.57	8.76	10.32	10.87	9.60	11.97
10.....	8.59	8.36	8.45	8.96	.....	9.79	9.97	8.71	10.91	13.41	17.08	10.78
11.....	8.61	8.39	8.45	8.92	.....	9.16	10.06	8.81	11.19	19.18	25.07	9.72
12.....	8.54	8.41	8.37	8.88	.....	9.16	.....	8.75	10.28	21.57	21.88	9.51
13.....	8.50	8.50	8.25	8.87	8.70	9.16	.....	8.76	10.15	16.25	18.01	9.38
14.....	8.49	8.46	8.49	8.82	8.55	9.64	.....	8.76	9.41	13.60	14.65	9.19
15.....	8.49	8.41	8.61	8.78	8.90	10.80	.....	9.11	9.49	11.33	12.33	9.12
16.....	8.37	8.40	8.51	8.83	8.89	10.55	.....	8.85	9.75	11.46	11.27	9.09
17.....	8.32	8.44	8.95	8.83	8.85	9.66	.....	8.85	12.66	11.48	12.09	9.26
18.....	8.27	8.42	9.02	8.74	9.55	9.32	.....	8.79	14.01	10.70	12.84	9.07
19.....	8.21	8.41	8.56	8.76	11.08	9.13	9.23	8.84	12.10	10.25	10.95	8.99
20.....	8.16	8.30	8.96	8.90	10.01	9.03	9.15	9.00	10.47	9.68	11.09	9.02
21.....	8.16	8.20	9.95	8.86	9.59	8.98	9.08	8.84	10.10	9.85	19.68	8.96
22.....	8.05	8.15	8.64	8.76	9.37	8.94	9.12	8.82	9.77	9.65	25.63	8.90
23.....	8.07	8.14	8.75	8.74	9.20	9.50	9.30	8.81	9.42	9.37	26.48	8.73
24.....	8.05	8.16	8.91	8.70	9.05	9.46	9.75	8.82	9.34	.....	24.52	8.82
25.....	8.53	8.20	8.71	8.70	8.95	10.45	9.50	8.91	9.21	.....	22.61	8.81
26.....	8.22	8.22	8.70	8.75	8.89	10.16	9.26	8.83	9.22	.....	18.67	8.91
27.....	8.16	8.15	8.74	8.86	8.83	9.41	9.01	8.82	9.24	10.49	14.93	9.21
28.....	8.14	8.09	8.78	8.87	8.80	9.18	8.88	9.16	9.45	10.66	12.56	9.20
29.....	8.20	8.07	8.70	8.84	8.80	9.12	8.91	.....	9.58	11.15	11.12	.....
30.....	8.17	8.15	8.66	8.89	8.87	8.98	8.82	.....	9.38	10.46	10.51	.....
31.....	8.20	8.09	.....	11.67	.....	8.85	8.80	.....	9.70	.....	10.15	.....

NOTE.—Water-gage recorder not in operation, November 2 to 12, January 12 to 18 and April 24 to 26. Intake obstructed by silt, June 29 and 30; gage-height record uncertain.

KESHEQUA CREEK

DESCRIPTION

Keshequa creek, the principal tributary to Canaseraga creek, has its source among the hills of northern Allegany county and flows north and northeast through Nunda and Tuscarora, joining Canaseraga creek near Sonyea, the home of the Craig Colony for Epileptics. Throughout its length of some 20 miles it flows through a narrow valley and falls about 1,200 feet. No power is developed, as the flow during the summer averages only 3 to 6 second-feet. The yearly rainfall is a little above the average for the Genesee valley and ranges from 28 to 36 inches.

KESHEQUA CREEK AT CRAIG COLONY, NEAR SONYEA

Location.—About 200 feet downstream from private highway bridge on grounds of Craig Colony at Sonyea, Livingston county.

Drainage area.—70* square miles. (Measured by the State Conservation Commission.)

Records available.—October 31, 1917, to June 30, 1919. Records were obtained from July 22, 1910, to December 31, 1912, at a site about 200 feet upstream, and from August 29, 1915, to October 31, 1917, at a station about one mile downstream, near the D. L. & W. railroad bridge.

Gages.—Vertical staff gage in three sections on retaining wall on left bank, just above control, graduated from 0 to 10.1, installed October 27, 1917. Read by A. J. Porter.

Discharge measurements.—Low-water measurements made by wading above the gage. High-water measurements made from downstream side of bridge.

Control.—Double-crested concrete weir built by Craig Colony for maintaining water-level for their pumping plant; permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 5.9 feet at 10 A. M., May 22; discharge, 5,940 second-feet. Mini-

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 69 square miles.

imum stage recorded, 0.13 foot at 8 A. M., August 20; discharge, 0.72 second-feet.

1917-1919: Maximum stage recorded, 5.9 feet, May 22, 1919; discharge, 5,940 second-feet. Minimum stage recorded, 0.13 foot at 8 A. M., August 20, 1918; discharge, 0.72 second-foot.

Ice.—Stage-discharge relation slightly affected by ice.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined from 0 to 450 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of KESHEQUA CREEK AT CRAIG COLONY, SONTA, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
1918			
July 15.....	E. D. Burchard.....	0.30	3.42
Aug. 21.....	E. D. Burchard.....	0.19	1.26
1919			
Jan. 25.....	E. D. Burchard.....	0.72	28.1
Apr. 1 a.....	J. W. Moulton.....	0.60	16.5
Apr. 14.....	J. W. Moulton.....	1.80	251
Apr. 15.....	J. W. Moulton.....	0.99	67.8
May 13.....	J. W. Moulton.....	1.45	205
May 23.....	O. W. Hartwell.....	1.74	317
May 27.....	J. W. Moulton.....	1.07	86.1
June 11.....	J. W. Moulton.....	0.84	45.3
June 13.....	J. W. Moulton.....	0.68	24.9
June 23.....	J. W. Moulton.....	0.45	9.98

a Some shore ice.

Daily discharge, in second-feet, of KESHEQUA CREEK AT CRAIG COLONY, SONTFA,
for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	7.0	5.6	1.8	5.6	33	8.6	20	9.6	56	18	56	28
2.....	7.5	3.8	2.6	5.9	24	15	88	8.2	21	23	54	26
3.....	9.8	3.2	3.0	7.0	22	11	34	9.6	22	25	40	23
4.....	5.6	2.6	2.2	7.8	18	9.6	11	12	21	33	37	19
5.....	4.8	4.1	3.0	6.3	35	12	26	11	33	45	51	30
6.....	5.6	6.3	6.3	4.5	23	12	35	9.6	26	34	38	22
7.....	3.8	5.2	3.0	30	17	8.6	38	10	16	40	30	97
8.....	4.1	2.3	2.2	18	15	13	30	9.6	17	36	28	90
9.....	3.8	15	3.0	11	13	48	23	8.6	142	90	37	290
10.....	6.3	7.5	2.5	8.6	13	22	18	5.6	102	234	1,080	70
11.....	7.5	6.3	2.0	7.8	12	18	15	7.8	77	660	590	40
12.....	4.8	2.4	1.4	7.4	10	17	16	9.1	54	258	325	33
13.....	3.4	7.0	3.0	8.2	11	20	17	8.2	56	142	176	25
14.....	4.1	3.0	4.8	8.6	11	41	23	12	20	100	95	21
15.....	3.4	2.0	3.8	8.2	8.6	70	80	25	28	68	70	26
16.....	4.5	2.2	3.4	7.8	8.6	43	21	11.0	47	110	60	20
17.....	4.1	1.6	14	7.0	8.6	28	21	11.0	164	79	120	18
18.....	4.8	3.0	9.3	6.6	17	23	20	8.6	187	61	98	15
19.....	3.0	2.0	13	4.8	33	19	23	9.6	72	48	56	13
20.....	2.4	0.8	21	6.3	19	15	17	8.6	50	51	154	10
21.....	2.2	1.3	15	9.1	16	17	18	13	45	45	660	12
22.....	2.6	1.4	5.2	9.1	16	16	21	13	36	33	1,850	9.1
23.....	2.6	1.4	6.3	8.6	15	26	30	17	28	28	362	10
24.....	3.0	1.1	4.8	8.6	13	22	58	15	35	128	263	7.4
25.....	15	1.0	7.5	8.6	12	79	34	14	24	77	204	9.6
26.....	5.9	0.9	7.0	7.0	11	40	23	13	23	72	105	12
27.....	3.4	1.0	8.8	9.6	9.1	25	19	9.6	23	90	86	17
28.....	1.8	1.4	7.0	9.6	6.6	20	16	11	33	77	63	14
29.....	9.3	1.2	6.3	14	10	17	17	.....	25	110	50	11
30.....	9.8	1.0	5.6	50	12	14	13	.....	30	65	40	11
31.....	9.8	2.4	.....	86	.....	15	12	.....	37	.....	35	.....
Mean...	5.32	3.23	5.96	12.8	15.7	24.0	25.4	11.1	50.0	96.0	223	34.3

NOTE.—Stage-discharge relation not affected by ice. Discharge estimated, October 24 and 30, and December 1 to 3, by comparing with hydrographs of Canaseraga creek at Cumminsville and Groveland Station.

Monthly discharge of KESHEQUA CREEK AT CRAIG COLONY, SONTFA, for the year
ended June 30, 1919

[Drainage area, 70 square miles]

MONTH	DISCHARGE IN SECOND-FEET				Run-off Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	15	1.8	5.32	0.077	0.09
August.....	15	0.8	3.23	0.047	0.05
September.....	21	1.4	5.96	0.086	0.10
October.....	86	4.5	12.8	0.183	0.21
November.....	35	6.6	15.7	0.224	0.25
December.....	79	8.6	24.0	0.343	0.40
January.....	88	11	25.4	0.363	0.42
February.....	25	5.6	11.1	0.159	0.17
March.....	187	16	50.0	0.714	0.82
April.....	660	18	96.0	1.37	1.53
May.....	1,850	28	223	3.19	3.68
June.....	290	7.4	34.3	0.490	0.55
The year.....	1,850	0.8	42.2	0.60	8.27

BARGE CANAL

BARGE CANAL NEAR SOUTH GREECE

Location.—Slope station between South Greece and Genessee river. The old Erie canal takes water from the Barge canal at South Greece. There is practically no diversion of water from the new canal from this point to the Genessee river, a distance of about 5 miles. The canal flows through a rock cut for nearly the entire distance.

Records available.—Gage heights and occasional discharge measurements from July 31, 1918, to June 30, 1919, except during winter season, when canal is closed.

Gages.—Two Gurley 7-day water-stage recorders with natural scale for gage heights. The float wells are 18 inches by 30 inches inside dimensions with the bottoms about 2 feet below normal canal level.

Gage No. 1 is located on the left bank near the spillway just below the junction lock at South Greece; inspected by the gatekeeper at the lock.

Gage No. 2 is located on the right bank just west of the upper gate in the guard-lock; inspected by the lock-tender.

Discharge measurements.—Made from the steel highway bridge just below gage No. 1. Occasional measurements at the guard-lock near gage No. 2.

Determination of discharge.—The field data have not yet been sufficient to permit of computing the discharge.

Regulation.—Flow in canal is regulated by operators at Lockport and South Greece.

Ice.—There is usually no flow in the canal during the winter months.

Coöperation.—Station established by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BARGE CANAL NEAR SOUTH GREECE, during the year ended June 30, 1919

DATE	Made by	GAGE HEIGHT		Discharge
		Gage No. 1	Gage No. 2	
1918		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 31.....	E. D. Burchard.....	0.83	0.83	708
Aug. 20.....	C. C. Covert.....	1.80	1.88	579
Aug. 26.....	E. D. Burchard.....	1.70	1.77	591
Sept. 25.....	E. D. Burchard.....	1.07	1.075	610
Sept. 28.....	E. D. Burchard.....	1.08	1.13	564
Oct. 5.....	E. D. Burchard.....	1.36	1.43	456
Nov. 8.....	E. D. Burchard.....	1.81	1.94	327
Dec. 12.....	E. D. Burchard.....	2.78	2.79	538
1919				
June 8.....	O. W. Hartwell.....	1.92	1.995	191
June 20.....	J. W. Moulton.....	1.89	1.945	273

Daily gage height, in feet, of BARGE CANAL NEAR SOUTH GREECE, GAGE No. 1, for the year ended June 30, 1919

DAY	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.85						1.64
2.....		1.81						2.16
3.....		1.77						2.10
4.....		2.00						2.00
5.....		2.26						2.05
6.....		2.44						
7.....		2.72						
8.....		2.70						2.01
9.....	1.84	2.83						2.36
10.....	1.77	3.25						2.62
11.....	1.64	2.75						2.30
12.....	1.86							1.86
13.....	1.87							1.83
14.....	1.72							1.95
15.....	1.64							1.93
16.....	1.59							1.85
17.....	1.62						2.44	1.88
18.....	1.77						2.38	1.94
19.....	2.16						2.06	1.95
20.....	2.67						2.14	1.92
21.....	2.22						2.34	1.92
22.....	1.90						2.58	1.82
23.....	1.81						2.09	2.05
24.....	1.84						2.02	2.04
25.....	1.70						2.53	1.93
26.....	1.64						2.18	1.94
27.....	1.71						1.86	2.16
28.....	1.61						1.68	2.22
29.....	1.87						1.44	2.29
30.....	1.89						0.97	2.06
31.....							1.27	

Daily gage height, in feet, of BARGE CANAL NEAR SOUTH GREECE, GAGE No. 2, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		0.73	1.80	0.84	2.87	1.88						1.72
2.....		0.89	1.79	0.75	2.19	1.83						2.25
3.....		1.07	1.82	1.00	2.20	1.70						2.19
4.....		1.81	1.82	1.42	2.24	2.00						2.07
5.....		1.37	1.84	1.37	2.11	2.25						2.12
6.....		1.47	1.88	1.68	2.41	2.48						2.24
7.....		1.65	1.87	1.64	2.06							2.18
8.....		1.82	1.90	1.86	1.79	2.69						2.07
9.....		1.77	1.94	1.78	1.85	2.83						2.43
10.....		1.64	1.98	1.63	1.80	3.12						2.72
11.....		1.58	1.90	1.54	1.70	2.67						2.40
12.....		1.64	1.87	1.51	1.92							1.94
13.....		1.74	1.93	1.58	1.88							1.90
14.....		1.89	2.06	1.53	1.76							2.03
15.....		1.94	2.05	1.60	1.68							2.00
16.....		1.89	2.14	1.69	1.61						2.29	1.93
17.....		1.85	2.21	1.64	1.62						2.54	1.97
18.....		1.82	2.36	1.59	1.81						2.49	2.01
19.....		1.83	2.80	1.55							2.15	2.02
20.....		1.80	2.32	1.58							2.20	1.96
21.....		1.77	2.29	1.61	2.25						2.41	1.99
22.....		1.76	2.61	1.60	1.94						2.67	1.92
23.....		1.73	1.80	1.66	1.85						2.19	2.12
24.....		1.68	1.22	1.70	1.81						2.09	2.06
25.....		1.66	1.03	1.67	1.69						2.62	1.93
26.....		1.65	0.96	1.68	1.67						2.25	1.97
27.....		1.56	0.88	1.62	1.74						1.96	2.25
28.....		1.51	1.03	1.69	1.58						1.77	2.33
29.....		1.58	1.13	1.83	1.83						1.52	2.47
30.....		1.54	0.97	1.84	1.87						1.05	2.28
31.....	0.63	1.63		2.06							1.35	

BARGE CANAL AT LOCK No. 32

Location.—At lock No. 32, Barge canal, about 5 miles east of the city of Rochester.

Records available.—May 17, 1919, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder, located 25 feet upstream from concrete weir in diversion channel south of the lock-house. Recorder inspected by M. H. Quigley, lock-tender at lock No. 32.

Discharge measurements.—Made by wading about 50 feet below gage.

Control.—The control is the crest of the spillway.

Determination of discharge.—Daily discharge over spillway determined by applying mean daily gage heights to rating table. Daily discharge through lock is obtained by multiplying the lock capacity by the number of lockages per day. The following tables of discharge include the flow over the spillway and through the lock.

Accuracy.—Stage-discharge relation practically permanent. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BARGE CANAL AT LOCK NO. 32, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
June 8.....	J. W. Moulton.....	1.05	30.0
June 10.....	J. W. Moulton.....	1.29	70.9
June 20.....	J. W. Moulton.....	1.243	62.1

Daily discharge, in second-feet, of BARGE CANAL AT LOCK NO. 32, for the year ended June 30, 1919

DAY	May	June	DAY	May	June	DAY	May	June
1.....		55	11.....		70	21.....	46	63
2.....		77	12.....		61	22.....	64	77
3.....		68	13.....		74	23.....	40	66
4.....		86	14.....		84	24.....	30	68
5.....		92	15.....		82	25.....	89	72
6.....		107	16.....		80	26.....	92	84
7.....		101	17.....	11	81	27.....	82	82
8.....		88	18.....	57	61	28.....	120	86
9.....		72	19.....	71	62	29.....	86	81
10.....		88	20.....	39	84	30.....	95	72
						31.....	59	
						Mean.....		77.7

Monthly discharge of BARGE CANAL AT LOCK NO. 32, for the year ended June 30, 1919

Months	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
June.....	107	55	77.7

BLACK CREEK, MONROE COUNTY

DESCRIPTION

Black creek rises in the extreme northern part of Wyoming county in the hilly region to the south of Batavia, flows in a general northerly direction to a point just north of the village of Byron, then turns to the east and enters the Genesee river at Genesee Junction. The slope of the creek is gradual for the greater part of its course, there being but one sharp descent, near the vil-

lage of Morganville, where it has a drop of about 140 feet in less than half a mile. The surrounding country is slightly rolling with some swamps and but few small ponds or lakes. The stream has numerous small tributaries, the principal one being Spring creek, which enters Black creek a short distance below the village of Byron.

BLACK CREEK NEAR GENESSEE JUNCTION

Gage No. 228

This station, established May 14, 1917, is located on Black creek, about $\frac{1}{2}$ mile above its junction with Genessee river. The gage, No. 228, is a standard Type A gage, having a range of 20 feet, between elevations 508.0 and 528.0 (B. C. datum). It is secured to the upstream end of the center pier of the old Genessee Valley canal aqueduct over Black creek. The gage was read once daily—in morning from July 1 to May 22 and in afternoon from May 22 to June 30—to half-tenths.

Daily elevation of water-surface (B. C. datum) of BLACK CREEK AT OLD CANAL AQUEDUCT AT GENESSEE JUNCTION, for the year ended June 30, 1919. J. Horton Begy, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	510.1	510.7	511.8	511.1	512.5	511.55	509.15	508.2	508.65	509.35	511.0	511.35
2.....	510.1	510.9	511.85	511.05	513.75	511.5	509.35	508.1	509.65	509.0	510.8	510.75
3.....	510.15	511.05	511.85	511.0	513.8	511.4	509.45	508.1	509.65	508.95	510.4	510.4
4.....	510.15	511.3	511.75	511.0	513.85	511.85	509.5	507.8	509.2	508.7	509.9	509.1
5.....	510.1	511.35	511.8	510.9	513.7	511.65	509.7	507.8	508.8	508.7	509.7	510.0
6.....	510.1	511.45	511.8	511.05	513.3	512.4	509.75	507.8	509.15	508.85	510.15	510.6
7.....	510.1	511.7	511.8	511.5	513.05	513.35	509.75	507.8	509.4	508.65	510.25	511.9
8.....	510.1	511.8	511.95	511.65	512.8	513.75	509.75	507.8	510.75	509.4	510.25	a
9.....	510.05	511.75	511.95	511.8	512.45	513.75	509.75	507.8	513.35	509.6	512.7	513.2
10.....	510.05	511.5	511.95	511.65	512.05	513.45	509.65	507.8	512.95	510.9	515.9	513.8
11.....	510.0	511.5	511.65	511.5	511.9	513.0	509.5	507.8	512.3	513.1	518.0	512.65
12.....	510.0	511.5	511.8	511.5	511.7	512.5	509.3	507.8	511.6	517.3	521.6	513.15
13.....	509.9	511.6	511.75	511.7	511.65	513.0	509.2	507.8	510.5	518.15	522.0	512.35
14.....	509.9	511.75	511.8	511.75	511.6	513.35	509.1	507.8	510.25	516.3	521.4	512.25
15.....	511.3	511.85	511.8	511.7	511.55	513.8	508.9	508.0	509.2	513.1	517.6	512.1
16.....	511.5	511.75	511.95	511.7	511.5	513.9	508.9	508.1	509.2	511.0	514.7	512.0
17.....	511.5	511.75	512.15	511.6	511.7	513.7	508.9	508.25	510.9	512.0	514.9	512.0
18.....	511.5	511.75	512.2	511.5	511.75	513.0	508.9	508.25	512.4	512.0	514.9	512.0
19.....	511.3	511.75	512.2	511.35	511.9	512.5	508.65	508.25	513.0	511.5	514.15	512.0
20.....	511.3	511.7	512.2	511.3	512.0	511.9	508.65	508.25	513.9	511.5	513.0	512.0
21.....	510.8	511.7	512.75	511.5	512.0	511.65	508.5	508.25	512.35	511.0	516.75	512.0
22.....	510.0	511.7	512.6	511.7	512.0	511.0	508.5	508.1	510.7	510.6	519.7	512.0
23.....	510.0	511.65	512.55	511.55	511.9	510.8	508.5	508.5	509.65	510.05	521.15	512.0
24.....	509.9	511.6	512.15	511.5	511.75	510.65	508.5	508.65	509.3	510.05	522.55	512.0
25.....	509.9	511.5	511.85	511.45	511.7	510.5	508.85	508.65	509.15	510.2	524.1	512.0
26.....	509.9	511.4	511.5	511.4	511.7	510.2	508.25	508.95	509.0	510.2	522.95	512.1
27.....	509.9	511.4	511.25	511.3	511.6	510.0	508.2	509.15	508.75	510.2	520.7	512.5
28.....	509.95	511.5	511.1	511.4	511.6	509.5	508.2	509.4	508.75	510.55	516.5	512.5
29.....	510.05	511.6	511.1	511.7	511.6	509.1	508.2	.....	508.9	511.3	513.3	512.4
30.....	510.15	511.5	511.1	512.25	511.6	508.75	508.2	.....	508.9	511.3	512.5	512.35
31.....	510.3	511.65	.....	512.95	.....	508.6	508.2	.....	508.9	.....	511.8	.....

a No record.

CANADICE LAKE

DESCRIPTION

Canadice lake is tributary to Genesee river through Hemlock lake outlet and Honeoye creek. The area drained by the lake forms an irregular rectangle, the lake lying somewhat to the left of the longitudinal axis and the greater portion of the drainage being on the eastern slope. The western slope is narrow and precipitous. Bald hill rises from an altitude of 1,090 feet at the lake to 1,800 feet at the summit and has its axis parallel to the lake at an average distance of three-fourths of a mile from it. The lake has a water-surface area of 1.01 square miles and drains a total area of 12.6 square miles, 8 per cent of which is lake surface.

A weir was constructed at the outlet at the foot of the lake by the city engineer's department of Rochester, N. Y., in February, 1903. The entire yield of the drainage basin passes this weir.

CANADICE LAKE OUTLET NEAR HEMLOCK

Location.—In outlet, at foot of lake, which discharges to Genesee river through Hemlock lake outlet and Honeoye creek.

Drainage area.—12.6 square miles, of which 1.01 square miles are lake surface.

Records available.—April, 1903, to date. Data also in water-supply paper, Surface Water-Supply of the United States, Part IV; St. Lawrence River Basin, published by the United States Geological Survey; also in reports of the city engineer of Rochester.

Gage.—Hook gage, in channel above weir.

Computation of discharge.—In November, 1915, the former timber and plank channel with an overfall weir about fifteen feet long, which could be shortened to five feet, was replaced by a concrete construction with an overfall weir at the same elevation with a crest ten feet long with end contraction suppressed, said

weir also being capable of being reduced by vertical needles to a five-foot weir with complete end contractions.

Diversions.—No water is diverted from Canadice lake above the station.

Regulation.—Outflow of lake at dam above weir is controlled by bulkhead and gates.

Ice.—Pool above weir is free from ice throughout winter.

Accuracy.—Observations and computations made with care; the result should be very good.

Coöperation.—Data collected and furnished for publication by office of city engineer, Rochester.

Mean monthly water-surface and monthly discharge of CANADICE LAKE NEAR HEMLOCK, for the year ended June 30, 1919
[Drainage area, 12.6 square miles.]

MONTH	Mean elevation of lake above low-water mark	DISCHARGE IN SECOND-FEET		RUN-OFF Depth in inches on drainage area
		Mean	Per square mile	
July.....	1.779	3.530	0.280	0.32
August.....	1.376	2.779	0.221	0.25
September.....	0.992	2.168	0.172	0.19
October.....	0.869	1.818	0.144	0.17
November.....	0.993	2.170	0.172	0.19
December.....	1.278	2.427	0.193	0.22
January.....	1.656	5.387	0.428	0.49
February.....	1.158	15.671	1.244	1.30
March.....	0.778	16.927	1.343	1.55
April.....	1.674	16.156	1.282	1.43
May.....	3.239	48.847	3.877	4.47
June.....	2.953	8.578	0.681	0.76
The year.....	1.562	10.538	0.836	11.34

NOTE.—As the outlet of the lake is controlled by gates, it is fair to state that the terminal water-surface for the year ended June 30, 1919, was 0.94 foot higher than the year before, corresponding to a gain in storage of 28,068,266 cu. ft., or a discharge of 0.890 cubic foot per second. This correction applied to the mean for the year gives 11.428 cubic feet per second, equivalent to 0.907 second-foot per square mile of drainage area, or a depth of run-off of 12.312 inches on the drainage area.

OSWEGO-ONEIDA-SENECA RIVER DRAINAGE BASIN**DESCRIPTION OF BASIN**

Oswego river is formed by the union of Seneca and Oneida rivers at Three River Point about twelve miles northwest of Syracuse, whence its course is northwestward to Oswego, where it enters Lake Ontario. The length of the river, from the junction to the mouth, is about 20.5 miles and the drainage basin along this distance is a narrow strip of country, moderately rolling. Above the junction of Seneca and Oneida rivers the basin spreads out, attaining an extreme width east and west of about 100 miles and north and south of from 70 to 80 miles. There is, on the whole, a gradual rise from the low, level lands which border Lake Ontario to the north-south ridges which separate the various lakes south of Seneca river and which farther south become merged with the still more elevated country lying along the southern boundary of the Lake Ontario watershed.

The most remarkable feature of the drainage basin is the chain of lakes stretching across its southern border. From west to east the principal lakes are, in order, Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles and Oneida. These seven lakes include a water-surface of approximately 270 square miles, increased by four smaller lakes — Cross, Onondaga, Otisco and Cazenovia — to about 283 square miles. The larger of the lakes, Oneida, Cayuga and Seneca, are used for steam-towing navigation, having connection with the Erie and Oswego canals, and together with Onondaga form a part of the New Barge canal system. Cayuga and Seneca lakes are noted for their depth and for the abrupt slopes of their beds. The influence of the lakes on Oswego river is of the utmost importance in contributing to the steadiness of its flow.

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 73

Drainage areas tributary to ONEIDA LAKE AND ONEIDA RIVER *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
East branch, Fish creek.			
Head to junction with Alder creek	45.40	45.40	
Alder creek	25.70	71.10	
Junction with Alder creek to junction with Point Rock creek	36.70	107.80	
Point Rock creek	19.90	127.70	
Junction with Point Rock creek to junction with Fall brook	4.50	132.20	
Fall brook	13.50	145.70	
Junction with Fall brook to junction with Florence creek	1.30	147.00	
Florence creek	20.40	167.40	
Junction with Florence creek to junction with Furnace creek (Taberg)	1.70	169.10	
Furnace creek	14.40	183.50	
Taberg to junction with West branch, Fish creek	3.60	187.10	
West branch, Fish creek.			
Head to lower dam, Williamstown	25.80	25.80	
Williamstown to West Camden	27.10	52.90	
West Camden to junction with Mad river, Camden	14.20	67.10	
Mad river	45.40	112.50	
Camden to junction with Little river	21.60	134.10	
Little river	52.10	186.20	
Little river to McConnellsville	4.00	190.20	
McConnellsville to junction with East branch, Fish creek	11.90	202.10	
Total, East and West branches, Fish creek		389.20	
Junction of East and West branches, Fish creek, to junction with Wood creek	27.80	417.00	417.00
Wood creek (Oneida county).			
Above Erie canal, Rome	10.20	10.20	
Erie canal, Rome, to junction with Mud creek	2.00	12.20	
Mud creek (Oneida county)	20.00	32.20	
Junction with Mud creek to junction with Canada creek	6.40	38.60	
Canada creek	31.00	69.60	
Junction with Canada creek to junction with Stony creek	1.20	70.80	
Stony creek	20.40	91.20	
Junction with Stony creek to junction with Fish creek	31.40	122.60	122.60
Oneida creek.			
Head to Peterboro	13.40	13.40	
Peterboro to Falls	6.70	20.10	
Falls to Munnsville	15.60	35.70	
Munnsville to Kenwood	27.30	63.00	
Kenwood to Oneida Castle (State dam)	10.80	73.80	
Oneida Castle to Soonondoa creek, Oneida	2.10	75.90	
Soonondoa creek	34.30	110.20	
Soonondoa creek to Durhamville	4.80	115.00	
Durhamville to mouth	28.00	143.00	143.00
Canaseraga creek (Madison county).			
Head to Perryville	5.70	5.70	
Perryville to Erie canal	9.00	14.70	
Erie canal to Douglas ditch	8.10	22.80	
Cowaselon creek.			
Head to Clockville creek	17.20	17.20	
Clockville creek	11.10	28.30	
Clockville creek to Erie canal	5.50	33.80	
Erie canal to mouth of Douglas ditch	39.30	73.10	
Total, all above junction with Douglas ditch		95.90	
Junction with Douglas ditch to Lakeport	3.20	99.10	99.10
Chittenango creek.			
Erieville reservoir, water-surface	0.45	0.45	
Erieville reservoir, land drainage	3.30	3.75	
Erieville reservoir to Casenovia lake	30.50	34.25	
Casenovia lake, water-surface	1.70	35.95	
Casenovia lake, land drainage	8.70	44.65	
Casenovia lake to Chittenango falls	14.40	59.05	
Chittenango falls to State dam, Chittenango	17.90	76.95	
State dam to junction with Butternut creek	28.10	105.05	
Butternut creek.			
Head to Jamesville reservoir	47.40	47.40	
Jamesville reservoir to State dam	5.70	53.10	
State dam to junction with Limestone creek	19.20	72.30	

* From U. S. Geological Survey topographic maps.

Drainage areas tributary to ONEIDA LAKE AND ONEIDA RIVER *— *Continued*

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
Chittenango creek — <i>Continued</i> .			
Butternut creek — <i>Continued</i> .			
Limestone creek.			
De Ruyter reservoir, water-surface.....	1.00	1.00	
De Ruyter reservoir, land drainage.....	17.80	18.80	
De Ruyter reservoir, to junction with East branch.....	4.30	23.10	
East, or New Woodstock branch.....	12.60	35.70	
Junction with East branch to junction with West branch.....	34.50	70.20	
West branch, Limestone creek, enters above State feeder dam.....	24.80	95.00	
State dam to junction with Butternut creek.....	18.20	113.20	
Total, Butternut and Limestone creeks, above junction.....		185.50	
Junction with Limestone creek to Chittenango creek.....	1.10	186.60	
Total, Chittenango and Butternut creeks, above junction.....		291.65	
Junction with Butternut creek to Bridgeport.....	30.30	321.95	
Bridgeport to Oneida lake.....	4.30	326.25	326.25
Oneida lake drainage through main streams.....		1,107.95	
Big Bay creek.....	26.30		
Little Bay creek.....	11.50		
Scriba creek.....	45.40		
Coast drainage, north shore Oneida lake.....	54.50		
Coast drainage, south shore Oneida lake.....	28.90	166.60	1,274.55
Water-surface, Oneida lake.....	78.00		
Land drainage, Oneida lake.....	1,274.55	1,352.55	
Oneida river.			
Brewerton to Caughdenoy creek.....	4.80	4.80	1,357.35
Caughdenoy creek.....	19.30	24.10	1,376.65
Caughdenoy creek to Oak Orchard.....	25.10	49.20	1,401.75
Mud creek (Onondaga county).....	34.70	83.90	1,436.45
Oak Orchard to Potts creek.....	5.00	88.90	1,441.45
Potts creek.....	22.90	111.80	1,464.35
Six-Mile creek (Oswego county).....	24.00	135.80	1,488.35
Potts creek to Three River Point.....	4.50	140.30	1,492.85

Drainage areas tributary to SENeca RIVER *

LOCALITY	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
Mud creek (Ontario county).				
Head to and including Schaffer creek.....	51.31			
Junction with Schaffer creek to junction with Sucker brook, Victor (formerly Ganargua creek).....	25.70	77.01		
Sucker brook.....	20.15	97.16		
Ganargua creek.				
Victor to Erie canal, Macedon.....	26.20	123.36		
Macedon to junction with East Red creek, East Palmyra.....	55.00	178.36		
East Red creek.....	59.50	237.86		
East Red creek to Canandaigua outlet.....	61.37	299.23	299.23	
Canandaigua lake.				
Naples creek.....	48.55	171.97		
West river.....	42.08			
Other land drainage.....	81.34			
Water-surface.....	16.40		188.37	

* From U. S. Geological Survey topographic maps.

Drainage areas tributary to SENECA RIVER — *Continued*

LOCALITY	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
Canandaigua outlet.				
Foot of the lake to and including Black brook..	50.37	238.74		
Black brook to Flint creek, at Phelps.....	54.34	293.08	293.08	
Flint creek.				
Above Patten.....	31.59			
Patten to Gorham, not including Gorham swamp.....	24.84	56.43		
Gorham swamp.....	5.46	61.89		
Gorham to Orleans.....	25.57	87.46		
Orleans to junction with Canandaigua outlet at Phelps.....	15.21	102.67	395.75	
Phelps to junction with Canargua creek at Lyons, forming Clyde river.....	48.36	444.11	743.34	
Clyde river.				
Lyons to junction with Seneca river, foot of Cayuga lake.....	141.11	884.45		884.45
Seneca river.				
Seneca lake.				
Keuka lake.				
Land drainage to outlet.....	160.96			
Water-surface.....	17.51	178.47		
Keuka outlet to Seneca lake.....	24.80	203.27		
Catharine creek.				
Above Montour Falls.....	66.46		640.93	
Montour Falls to Seneca lake.....	29.91	96.37		
Glen creek.....	23.53	23.53		
Direct lake drainage.....	317.76	317.76		
Water-surface.....	67.16		708.09	
Seneca river, foot of Seneca lake to Waterloo..	40.90		748.99	
Seneca river, Waterloo to Seneca Falls.....	28.55		777.54	
Seneca river, Seneca Falls to Mud lock, foot of Cayuga lake.....	7.52		785.06	
Cayuga lake.				
Cascadilla creek.....	14.38			
Six-Mile creek.....	59.05			
Buttermilk creek.....	29.16			
Cayuga inlet.....	67.02			
Salmon creek.....	91.13			
Fall creek.				
Above Freeville.....	58.68			
Virgil creek.....	26.00	84.68		
Freeville to Cornell dam.....	30.62	115.30		
Cornell dam to Cayuga lake.....	1.56	116.86		
Taghanic creek.				
Above Halseyville.....	56.96			
Halseyville to Taghanic falls.....	10.40	67.36		
Taghanic falls to Cayuga lake.....	0.39	67.75		
Other Cayuga lake drainage.....	275.04	720.39		
Cayuga lake, water-surface.....	66.31	786.70	1,571.76	
Seneca river, Cayuga lake to junction with Clyde river.....	15.42		1,587.18	2,471.63
Seneca river, junction with Clyde river to junction with Owasco outlet.....	146.23			2,617.86
Owasco lake.				
Owasco inlet, above Moravia.....	74.33			
Moravia to Owasco lake.....	42.92	117.25		
Direct drainage to lake.....	76.24	193.49		
Foot of lake to State dam.....	0.98	194.47		
Water-surface.....	10.40	204.87		
Owasco outlet to junction with Seneca river.....	16.73	221.60		2,839.46
Seneca river, junction with Owasco outlet to junction with Skanateles outlet.....	98.70			2,938.46
Skanateles lake.				
Land drainage to foot.....	58.41			
Water-surface.....	14.13	72.54		
Foot of lake to Willow Glen.....	1.84	74.38		
Willow Glen to Seneca river.....	16.69	91.07		3,029.23
Seneca river, Skanateles outlet to Carpenter brook.....	25.50			3,054.73

REPORT OF STATE ENGINEER

Drainage area: tributary to SENECA RIVER — *Concluded*

LOCALITY	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
<i>Seneca River — Continued.</i>				
Carpenter brook	18.70	.....	.....	3,073.43
Seneca river, Carpenter brook to Baldwinsville..	49.10	.....	.....	3,139.33
Seneca river, Baldwinsville to Onondaga outlet	17.80	.....	.....	3,121.50
Onondaga lake.				
Otisco lake, land drainage to foot.....	41.43			
Otisco lake, water-surface.....	3.30	44.70		
Nine-Mile creek, Onondaga county (Otisco outlet), to Onondaga lake.....	74.00	118.70		
Onondaga creek.				
Above junction with West brook.....	40.60			
Junction with West brook to inflow to Onondaga lake.....	65.30	105.90		
Other land drainage to Onondaga lake.....	52.13	253.70		
Onondaga lake, water surface.....	4.70	258.40		
Onondaga outlet, lake to Seneca river.....	3.00	291.40		3,430.73
Seneca river, Onondaga outlet to Belgium.....	10.12	.....	.....	3,440.85
Seneca river, Belgium to Three River Point....	4.49	.....	.....	3,445.24

Drainage areas tributary to OSWEGO RIVER *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Total from Three River Point	Total drainage basin
Oneida river, above Three River Point .....	.....	.....	1,492.85
Seneca river, above Three River Point.....	.....	.....	3,445.24
Oswego river, at Three River Point.....	.....	.....	4,938.09
Three River Point to Phoenix.....	2.32	2.32	4,940.41
Phoenix to Hinmansville.....	17.58	19.90	4,957.99
Hinmansville to Ox creek.....	17.06	36.96	4,975.04
Ox creek.....	33.68	70.63	5,008.72
Ox creek to upper dam, Fulton.....	9.15	79.78	5,017.87
Fulton to Neatahwanta creek.....	9.15	88.93	5,027.02
Neatahwanta creek.....	21.92	110.85	5,048.94
Neatahwanta creek to Black creek.....	1.01	111.86	5,049.95
Black creek.....	37.93	149.79	5,037.88
Black creek to Battle Island.....	0.92	150.71	5,088.80
Battle Island to Minetto.....	2.11	152.82	5,090.91
Minetto to High dam.....	4.87	157.69	5,095.78
High dam to Oswego dam.....	1.22	158.91	5,097.00
Oswego dam to Lake Ontario.....	1.21	160.12	5,098.21

* From U. S. Geological Survey topographic maps.

OSWEGO RIVER

DESCRIPTION

The drainage area tributary to Oswego river, exclusive of Seneca and Oneida rivers, is 160 square miles. This area comprises chiefly moderately-rolling, cultivated upland, having a good depth of soil overlying the rock, which, as a rule, is visible only in the bed of the stream. A portion of the area is drained through lakes and marshes. The run-off from the direct drainage to Oswego river is moderate and the regimen differs but little from that resulting from the inflow of the two main tributaries — the Oneida and Seneca.

The river is canalized for practically its entire length by the Barge canal improvement and almost all of the 118.6 feet drop between canal pool at Three River Point and low water in Lake Ontario occurs at six dams, all having bulkhead gates for power purposes, the upper two of which have large Taintor gates for surface regulation. The Battle Island dam and old High dam have been drowned out by new structures — dam No. 5 at Minetto and dam No. 6 (new High dam) above Oswego, respectively.

In the following series of tables there are given records of the daily elevation of water-surface of the Oswego river at different gaging stations for the year ended June 30, 1918. Owing to the completion of the canal construction the locations at which certain water-surface elevations were taken have been shifted, in general being located on the finished structures. Locations of old and new gages and reasons for change are briefly noted.

The tables of elevations of water-surface are arranged in order, proceeding downstream from Three River Point to Lake Ontario. The water-surface is in general read to the nearest tenth of a foot, usually either on a staff gage or by measuring down from a reference point.

OSWEGO RIVER ABOVE DAM AT PHOENIX

Gage No. 180

Records published previous to 1914 as "above dam at Phoenix" are of "East line gage," located on the east side of the river, March 1, 1912, to May 5, 1913, between 200 and 250 feet above east bulkhead, and May 6, 1913, to December 31, 1914, at the shore end of east bulkhead. This gage was discontinued and the

record is taken at the upper end of the guide-wall to Barge canal lock No. 1. Gagings which may be considered the beginning of this new record have been taken from May 18, 1912, to December 31, 1914, at the upper end of lock No. 1.

On July 27, 1916, a standard Type B gage, No. 180, was erected near the angle in the east upper guide-wall above Lock street bridge, and has a range of 12 feet, between elevations 358.0 and 370.0. A standard bench-mark plug was set in the face of the wall near the gage, at elevation 368.0 (B. C. datum).

Barge canal construction has replaced the old crest at about elevation 359.1 with two sections of fixed crest at elevation 363.0, running diagonally upstream to six Taintor gates, each twenty-eight feet six inches clear span, immediately below the Lock street bridge.

The gage is read twice daily—morning and afternoon—to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER ABOVE DAM AT PHOENIX, for the year ended June 30, 1919. C. E. Greenfield, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.75	363.80	363.35	363.85	363.90	363.75	363.70	363.80	363.95	364.20	364.50	364.05
2.....	363.45	363.70	363.60	363.88	363.80	364.00	364.00	363.80	364.15	364.15	364.60	364.00
3.....	363.60	363.60	363.52	363.78	364.00	363.85	363.95	363.85	364.05	364.20	364.35	363.75
4.....	363.75	363.75	363.50	363.80	364.00	363.75	364.00	363.90	364.20	364.30	364.15	363.80
5.....	363.70	363.80	363.42	363.90	363.85	363.72	363.85	363.90	364.00	364.45	364.20	363.80
6.....	363.65	363.80	363.42	363.95	363.80	363.75	363.90	364.00	364.20	364.20	364.30	363.70
7.....	363.65	363.75	363.40	363.95	363.85	363.82	363.72	364.18	364.10	364.20	364.30	363.85
8.....	363.55	363.70	363.45	364.00	363.78	363.80	363.75	364.15	364.10	364.25	364.15	363.95
9.....	363.65	363.75	363.60	363.90	363.75	363.90	363.75	364.00	364.30	364.40	364.20	364.00
10.....	363.65	363.75	363.45	363.85	363.70	363.90	363.70	363.90	364.60	364.40	364.40	363.95
11.....	363.85	363.85	363.45	363.85	363.72	363.85	363.80	363.88	364.62	364.55	364.30	364.10
12.....	363.80	363.88	363.50	364.00	363.85	363.78	364.10	363.85	364.50	364.90	364.40	363.95
13.....	363.80	363.80	363.60	363.98	363.68	363.90	364.20	363.80	364.30	364.90	364.40	363.80
14.....	363.80	363.68	363.60	363.85	363.75	364.12	364.15	364.05	364.40	364.70	364.35	363.80
15.....	363.70	363.62	363.75	363.80	363.95	364.00	364.05	364.00	364.35	364.55	364.15	363.85
16.....	363.75	363.55	363.80	363.80	364.00	363.90	363.98	363.88	364.35	364.45	364.15	363.80
17.....	363.72	363.55	363.80	363.80	363.98	363.90	363.95	363.90	364.40	364.55	364.10	363.90
18.....	363.70	363.60	363.80	363.80	364.00	363.90	363.90	363.85	364.55	364.10	364.05	363.95
19.....	363.70	363.68	363.80	363.80	363.90	363.80	364.00	363.70	364.70	364.05	364.45	363.75
20.....	363.65	363.58	364.00	363.95	363.85	363.78	363.98	363.70	364.70	364.10	364.20	363.80
21.....	363.85	363.60	364.00	363.85	363.75	363.80	363.90	363.68	364.65	364.40	364.00	363.75
22.....	363.85	363.50	364.10	363.80	363.75	363.80	363.90	363.60	364.40	364.55	364.05	363.70
23.....	363.80	363.50	364.05	363.80	363.80	363.80	363.95	363.75	364.35	364.50	364.30	363.88
24.....	363.85	363.35	363.98	363.80	363.75	364.00	364.10	363.95	364.35	364.45	364.20	363.90
25.....	363.90	363.35	363.92	363.80	363.70	364.00	364.00	364.00	364.40	364.40	364.30	363.85
26.....	363.90	363.50	363.98	363.90	363.80	363.90	364.05	364.00	364.40	364.50	364.35	363.70
27.....	363.85	363.50	364.02	363.95	363.82	363.80	363.95	364.00	364.30	364.40	364.35	363.65
28.....	363.95	363.45	364.10	363.85	363.85	363.75	364.00	363.90	364.10	364.35	364.25	363.75
29.....	364.00	363.45	364.00	363.88	363.78	363.75	363.92	.....	364.25	364.45	364.05	363.90
30.....	363.90	363.30	363.95	363.80	363.65	363.75	363.90	.....	364.35	364.50	364.00	363.80
31.....	363.82	363.28	.....	363.95	.....	363.70	363.80	.....	364.20	.....	363.90	.....

OSWEGO RIVER BELOW DAM AT PHOENIX

Gage No. 179

The record of water-surface, "1,600 feet below dam at Phoenix," is that of the "North line gage" and has been taken as follows: November 1, 1910, to February 9, 1914, at junction of canal and river about 1,600 feet below the dam; February 10, 1914, to May 14, 1914, in river at temporary bridge about 800 feet below dam; May 15, 1914, and thereafter, in canal at lower end of Barge canal lock No. 1, at which location the surface is practically the same as at the junction of the canal and river.

On July 28, 1916, a standard Type B gage, No. 179, was erected on the end of the lower north approach wall to lock No. 1, and has a range of 16 feet, between elevations 352.0 and 368.0. The gage bench-mark, a copper plug set in stone at northwest corner of lock No. 1, is at elevation 368.55 (B. C. datum).

The gage is read twice daily—morning and afternoon—to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (B. C. datum) of Oswego River, 1,600 FEET BELOW DAM AT PHOENIX, for the year ended June 30, 1919. C. E. Greenfield, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	354.25	353.10	352.35	354.30	355.55	354.40	354.30	355.05	354.15	355.90	356.55	356.70
2.....	354.15	353.00	352.75	354.75	355.20	354.45	354.55	355.65	355.00	356.00	356.65	356.55
3.....	353.25	353.00	352.85	353.70	355.30	354.40	355.25	355.15	355.05	355.85	356.85	356.10
4.....	353.75	352.80	352.90	354.40	355.35	354.05	355.45	354.55	354.35	356.15	356.40	355.20
5.....	354.35	353.25	352.95	353.95	355.20	353.85	355.15	354.60	354.40	356.80	356.40	355.10
6.....	354.40	352.95	353.05	354.15	355.10	353.90	355.65	354.50	354.45	356.90	356.55	354.80
7.....	354.20	352.90	353.05	354.30	354.65	354.25	355.20	354.00	354.45	356.82	356.30	355.05
8.....	353.90	352.95	352.85	354.20	354.45	354.40	354.95	353.95	354.22	356.30	356.40	355.15
9.....	353.00	353.05	353.05	354.70	354.45	354.25	354.90	354.55	355.25	356.05	356.90	355.35
10.....	353.15	353.05	353.05	354.45	354.50	354.55	355.45	354.60	356.10	356.55	356.20	355.30
11.....	353.50	353.00	353.05	354.25	354.30	354.80	355.20	353.65	356.35	356.20	357.10	355.30
12.....	354.10	353.38	353.05	354.50	354.25	354.45	355.10	353.40	356.45	357.40	356.95	355.50
13.....	354.65	353.00	353.20	354.45	354.50	354.00	355.25	353.05	356.25	358.05	357.35	354.95
14.....	354.85	352.90	353.25	354.85	354.00	354.95	354.70	353.65	355.80	358.20	357.25	354.50
15.....	354.60	352.98	353.30	354.20	353.65	355.45	354.80	354.05	355.75	357.75	356.90	355.20
16.....	353.30	352.90	353.50	354.05	354.55	355.55	354.75	354.85	355.65	357.35	356.35	354.50
17.....	353.30	353.00	353.40	353.95	354.75	356.00	354.70	354.70	356.15	356.90	356.30	354.90
18.....	353.30	352.80	353.25	354.35	355.25	355.80	354.75	354.15	356.35	356.60	356.36	354.60
19.....	353.15	352.90	353.45	354.45	354.90	355.55	354.70	353.85	356.65	356.45	356.40	354.75
20.....	353.35	353.00	353.90	354.45	354.90	355.25	355.15	353.60	356.80	356.50	356.20	353.65
21.....	353.82	352.75	354.55	354.30	354.80	355.25	354.80	353.65	356.75	356.40	356.50	353.60
22.....	354.00	353.00	354.75	354.30	355.00	355.60	354.55	353.70	356.70	356.35	356.35	354.20
23.....	353.38	352.90	353.70	354.15	354.60	354.20	354.90	354.00	356.85	356.15	357.40	354.25
24.....	353.10	353.00	354.15	354.30	354.65	355.45	355.85	354.55	356.40	356.05	357.85	353.35
25.....	353.10	352.85	354.80	354.20	354.30	355.85	355.85	353.35	356.10	355.55	356.05	353.40
26.....	353.05	352.80	354.70	355.05	354.25	355.60	355.75	353.60	356.00	356.10	357.95	353.40
27.....	353.20	353.10	354.45	355.20	354.15	355.25	355.70	353.92	356.30	356.30	357.50	353.30
28.....	353.45	353.15	354.65	355.25	354.65	355.10	355.55	353.75	355.75	355.85	357.25	353.30
29.....	353.45	352.95	354.65	354.45	354.30	356.25	355.35	.....	355.30	356.90	356.85	354.25
30.....	353.15	352.92	354.25	354.75	354.20	355.20	355.30	.....	356.15	356.45	356.80	354.10
31.....	353.05	352.90	.....	355.30	.....	354.85	355.10	.....	356.30	.....	356.50	.....

OSWEGO RIVER AT HINMANSVILLE

Gage No. 178

The Hinmansville highway bridge across the Oswego river is about three miles north of Phoenix. This station was established April 13, 1904, and discontinued February 25, 1914, owing to the removal of the old highway bridge. During this period a chain gage located on the downstream side of the bridge pier was read. The station was reestablished January 1, 1915. A direct-reading staff gage, located on the south abutment of a highway bridge over the mouth of the creek entering the river from the west immediately above the abutment of the Hinmansville bridge, was replaced on August 8, 1916, by a standard Type A gage, No. 178, erected in the same location and having a range of $11\frac{1}{2}$ feet, between elevations 351.5 and 363.0. The gage bench-mark, consisting of a square cut in the southwest corner of the south abutment of the highway bridge over the creek, is at elevation 362.899 (B. C. datum).

The gage is read once daily — A. M.— to half-tenths.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER AT HINMANSVILLE BRIDGE, NEAR PHOENIX, for the year ended June 30, 1919. Leon Hallenbeck and Arthur Grey, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1.....	354.0	352.9	353.2	353.9	355.0	354.2	354.3	354.7	353.1	355.6	356.1
2.....	353.7	353.0	353.7	354.9	354.4	355.6	355.6	355.5	353.3	355.5	355.8
3.....	353.0	353.9	352.9	353.4	355.8	354.3	354.3	354.8	354.4	355.2	355.8
4.....	354.4 ⁵	353.5	352.8	353.7	354.5	353.7	355.0	351.7	354.0	355.5	355.7
5.....	354.5	353.0	353.1	353.9	354.8	353.9	355.7	354.5	354.0	356.0	355.3
6.....	354.0	352.8	353.0	353.9	354.6	353.8	355.1	354.2	354.3	356.3	355.8
7.....	353.9	352.7	352.9	354.1	354.5	353.9	354.7	354.3	353.8	356.5	355.7
8.....	353.8	352.9	353.2	354.3	354.0	354.4	354.5	354.7	353.2	356.0	355.6
9.....	352.8	353.0	353.0	354.5	354.3	354.25	354.6	354.4	354.2	355.2	354.8
10.....	353.0	352.9	352.9	354.0	354.5	354.4	354.9	354.1	354.0	356.2	355.8
11.....	353.3	353.3	352.7	354.1	354.0	354.8	355.1	354.5	355.3	355.2	356.5
12.....	354.0	352.8	352.9	354.2	353.5	354.6	354.8	354.6	355.7	356.6	356.8
13.....	354.3	352.6	353.1	354.2	353.7	353.8	354.7	352.6	355.8	356.7	356.6
14.....	354.5	352.7	353.2	354.0	354.0	354.8	353.7	352.6	355.9	357.0	356.4
15.....	354.3	352.9	353.5	353.7	354.2	355.6	354.3	354.0	354.5	356.6	356.2
16.....	353.0	352.7	353.1	353.5	354.2	354.8	354.4	353.1	356.0	356.2	355.4
17.....	353.0	352.8	353.4	353.0	354.3	355.8	354.5	354.5	355.7	355.9	355.5
18.....	353.0	353.0	352.3	353.3	355.0	355.5	354.6	353.1	355.8	355.4	355.9
19.....	352.8	352.7	353.4	353.9	354.7	355.2	355.1	354.3	356.2	355.3	355.6
20.....	353.0	352.6	353.7	354.2	354.9	355.1	354.9	354.4	356.4	355.6	355.4
21.....	353.9	352.9	354.3	354.0	354.9	355.1	354.6	354.6	356.3	355.1	355.5
22.....	353.0	352.7	354.7	353.9	354.9	355.1	354.5	354.4	356.2	355.6	355.3
23.....	353.2	352.8	354.2	353.9	354.7	355.7	354.8	354.6	356.4	355.1	356.5
24.....	353.0	353.0	353.7	354.3	354.3	355.1	354.6	353.5	356.4	355.6	356.7
25.....	352.8	353.1	354.3	354.5	353.75	355.5	355.6	353.0	355.8	354.9	356.8
26.....	352.8	353.0	354.5	354.8	353.9	355.4	355.7	353.7	355.5	355.4	357.0
27.....	352.7	353.2	354.3	351.8	354.2	354.7	355.7	354.1	355.8	356.1	356.3
28.....	353.0	353.0	354.3	354.6	354.3	354.1	355.2	353.2	355.6	355.4	356.0
29.....	352.8	352.8	354.4	353.9	354.3	355.0	355.3	.....	354.9	356.3	355.2
30.....	352.9	353.0	354.1	354.3	353.9	355.3	355.3	.....	354.8	356.24	355.7
31.....	352.9	353.1	.....	354.7	.....	354.7	355.1	.....	355.9	.....	355.9

NOTE.—Station discontinued May 31, 1919.

OSWEGO RIVER AT OX CREEK, NEAR FULTON

Gage No. 177

Ox creek enters the Oswego river from the west, four miles upstream from the upper dam at Fulton. On April 12, 1904, a gaging station was established near its junction with Oswego river. A direct-reading staff gage, located on the downstream end of the north abutment of the Fulton-Phoenix highway bridge over Ox creek, was replaced on August 7, 1916, by a standard Type A gage, No. 177, in the same location. A standard bench-mark plug was set in the face of the abutment near the gage at elevation 358.0 (B. C. datum). This gage is about 700 feet upstream from the mouth of the creek and during floods in the creek there may be some slight drop between the gage and the river.

The gage is read once daily — at about 11 A. M. — to half-tenths and even hundredths.

Daily elevation of water-surface (B. C. datum) of Oswego River at Mouth of Ox Creek, near Fulton, for the year ended June 30, 1919. B. M. Wilcox, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	353.80	352.60	352.20	353.86	354.58	353.90	354.00	354.60	353.65	354.95	354.92	354.70
2.....	353.16	352.55	352.81	354.22	354.52	353.85	354.85	355.24	354.15	354.90	355.20	354.60
3.....	352.72	352.65	352.56	352.90	354.60	353.70	354.90	355.00	354.70	354.88	354.92	354.60
4.....	353.65	352.38	352.65	353.85	353.70	353.35	354.95	354.18	353.84	354.95	354.80	354.18
5.....	353.80	352.60	352.55	353.00	354.30	353.32	355.30	354.22	353.80	355.40	354.50	354.00
6.....	354.00	352.64	352.65	353.60	354.02	353.30	354.78	354.20	353.82	355.85	355.26	354.00
7.....	353.80	352.65	352.65	353.35	353.00	353.65	354.40	353.78	353.90	355.70	355.28	354.45
8.....	353.84	352.60	352.65	353.40	353.68	353.64	354.18	353.42	353.50	355.45	355.00	353.80
9.....	352.75	352.70	352.70	354.05	353.60	353.40	354.15	353.85	354.12	354.52	354.02	353.95
10.....	352.74	352.72	352.52	353.50	353.60	353.90	354.20	354.05	355.48	355.55	354.56	354.82
11.....	352.80	352.68	352.55	353.30	353.00	353.80	354.25	353.25	355.45	354.10	355.35	353.80
12.....	353.41	352.75	352.70	354.00	353.90	353.80	354.65	352.98	355.52	355.75	355.25	354.46
13.....	353.15	352.80	352.70	353.80	354.85	353.25	354.18	352.98	355.40	355.84	355.50	354.00
14.....	354.10	352.70	352.85	353.60	353.52	354.25	353.90	353.10	355.18	355.60	354.92	353.80
15.....	353.40	352.60	353.10	353.60	353.52	354.75	353.90	353.60	355.00	355.44	354.80	354.90
16.....	352.75	352.42	352.74	353.35	354.22	354.82	353.90	354.00	355.20	355.00	354.30	353.12
17.....	352.75	352.65	352.90	353.00	353.05	355.22	353.90	354.45	355.54	354.75	354.30	354.60
18.....	352.72	352.50	352.90	352.75	354.20	355.00	354.10	353.60	355.42	354.44	354.85	353.52
19.....	352.72	352.55	353.20	353.80	353.95	354.80	354.70	353.40	355.65	354.42	354.75	354.24
20.....	352.95	352.60	353.25	354.00	353.82	354.72	354.55	353.10	355.84	354.05	354.48	353.20
21.....	353.62	352.40	354.15	353.60	353.85	354.58	354.32	352.90	355.05	354.00	354.85	352.80
22.....	353.40	352.62	354.20	353.65	354.35	355.00	354.00	352.75	355.70	354.05	354.25	353.50
23.....	352.60	352.55	354.00	353.55	354.25	353.25	354.42	353.15	355.80	354.92	354.52	353.65
24.....	352.65	352.55	353.20	353.30	354.25	354.80	355.12	353.80	355.62	354.85	354.45	352.80
25.....	352.55	352.65	354.20	353.30	353.00	355.25	355.30	352.90	355.30	354.00	355.50	352.80
26.....	352.54	352.45	354.00	354.35	353.62	355.50	355.45	352.90	355.30	354.50	355.72	352.95
27.....	352.65	352.60	354.00	354.50	353.45	354.10	355.02	353.20	355.28	354.52	354.95	352.84
28.....	353.45	352.80	354.10	354.40	354.05	354.05	354.95	353.10	354.62	354.72	354.84	352.72
29.....	352.00	352.65	354.15	353.55	353.55	354.50	354.82	.....	354.35	355.75	354.45	353.20
30.....	352.75	352.60	353.40	353.72	353.60	354.75	354.80	.....	355.10	355.55	354.55	354.15
31.....	352.60	352.60	.....	354.60	.....	354.15	354.80	.....	355.28	.....	354.25	.....

OSWEGO RIVER ABOVE UPPER DAM, FULTON

Gage No. 176

The record previously published as "above Oswego Falls Dam, Fulton," is from a gage located a short distance above the dam on the river side of the upper approach wall to Barge canal lock No. 2, and was discontinued, November 30, 1914. Gagings on the other side of the wall, *i. e.* in the approach to the lock, giving the water-surface above the dam more correctly than those on the river side of the wall, were begun June 7, 1912. On August 9, 1916, the staff gage was replaced by a standard Type A gage, No. 176, erected at the south end of the upper west gate recess of lock No. 2, and having a range of 12 feet, between elevations 349.0 and 361.0. A standard bench-mark plug was set in the wall near the gage at elevation 358.0 (B. C. datum).

The gage was read twice daily to half-tenths—at 6 A. M. and 6 P. M., July 1 to November 26 and May 4 to June 30, and at 8 A. M. and 4 P. M., November 27 to May 3.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER ABOVE UPPER DAM, FULTON, for the year ended June 30, 1919. Ed. L. Parker, H. H. Carlin and Bernard Malis, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	353.98	352.82	352.40	354.15	354.25	354.10	354.45	354.60	353.65	354.70	354.75	354.55
2.....	353.35	352.95	352.70	354.32	354.20	354.10	353.98	355.35	354.15	355.40	354.55	354.25
3.....	352.85	352.70	352.75	353.10	354.35	353.95	354.62	354.70	354.40	354.60	354.75	354.10
4.....	353.60	352.50	352.85	353.90	354.25	353.78	354.85	354.20	354.30	354.80	354.55	353.80
5.....	354.20	353.20	352.80	353.30	354.10	353.50	355.28	354.20	353.75	355.40	354.80	354.05
6.....	354.10	352.85	352.90	353.60	353.92	353.35	354.80	354.15	353.85	355.00	355.10	354.05
7.....	354.05	353.00	353.00	353.62	353.82	353.85	354.55	353.65	353.80	355.35	355.05	354.15
8.....	353.60	352.75	352.90	353.60	353.58	354.35	354.25	354.00	353.65	354.80	354.70	354.10
9.....	353.05	352.85	352.95	354.08	353.65	353.75	354.20	354.32	354.95	354.20	354.10	354.40
10.....	353.00	352.90	352.90	353.92	353.80	353.98	354.40	354.15	355.50	354.75	354.60	354.30
11.....	353.12	352.85	353.05	353.50	353.65	354.25	354.25	353.15	355.40	353.55	355.15	354.15
12.....	353.12	353.30	352.95	354.18	353.60	353.98	354.50	352.90	355.40	355.15	354.65	354.35
13.....	353.65	352.80	353.00	353.42	354.00	353.60	354.30	352.70	355.20	355.65	355.00	353.90
14.....	354.15	352.75	353.02	353.50	353.45	354.30	354.00	353.30	354.95	355.15	354.55	353.85
15.....	353.85	352.80	353.20	353.65	353.20	354.75	354.00	353.65	355.05	354.75	354.25	353.95
16.....	352.95	352.65	353.35	353.50	354.05	354.65	354.05	354.45	355.50	354.45	354.20	354.00
17.....	352.90	353.00	353.15	353.30	353.95	355.25	354.45	354.28	355.30	354.10	354.15	354.10
18.....	352.95	352.90	353.02	353.60	353.85	355.15	354.15	353.50	355.32	353.95	354.70	353.70
19.....	352.85	352.95	353.30	353.95	354.00	354.90	354.72	353.30	355.55	354.00	354.55	354.00
20.....	353.00	352.90	353.42	354.10	353.95	354.25	354.65	353.10	355.65	354.80	354.25	353.10
21.....	353.55	352.75	354.12	353.80	353.58	354.60	354.30	352.90	355.55	354.20	354.30	353.25
22.....	353.70	352.95	354.38	353.90	353.85	354.90	354.10	353.05	355.60	354.70	354.10	353.65
23.....	353.05	352.75	354.25	353.95	353.90	353.30	354.52	353.80	356.00	354.60	354.50	353.60
24.....	352.90	352.90	353.60	353.90	354.20	354.30	355.05	353.55	355.40	354.40	355.00	353.00
25.....	352.95	353.00	354.45	353.82	353.70	355.10	355.42	353.00	355.15	353.90	355.05	353.00
26.....	352.90	352.80	353.95	354.55	353.50	354.42	355.38	353.05	355.10	354.60	354.85	352.95
27.....	352.80	352.98	354.25	354.65	353.05	354.25	355.18	353.15	355.30	354.90	354.25	352.80
28.....	353.40	353.12	354.48	354.45	354.30	354.05	355.05	353.20	354.45	354.50	354.00	353.00
29.....	353.40	352.85	354.50	353.45	353.78	354.55	354.85	.....	354.10	355.35	354.25	353.80
30.....	352.90	352.85	354.15	354.00	354.35	354.55	354.85	.....	355.40	354.95	354.00	353.95
31.....	352.85	352.85	.....	354.25	.....	354.30	354.68	.....	354.90	.....	353.95	.....

OSWEGO RIVER BELOW UPPER DAM, FULTON

Gage No. 175

This station was established February 11, 1913, as gage "No. 66 about 2,300 feet above lower dam," Fulton, which is practically the same location as that occupied by direct-reading staff gage at the end of the west lower approach wall to Barge canal lock No. 2, which was replaced on August 10, 1916, by a standard Type B gage, No. 175, erected at the same location and having a range of 12 feet, between elevations 333.0 and 345.0. A standard bench-mark plug was set in the wall near the gage at elevation 340.0 (B. C. datum).

The gage is read twice daily to half-tenths — at 6 A. M. and 6 P. M., July 1 to November 26 and May 4 to June 30, and at 8 A. M. and 4 P. M., November 27 to May 3.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER BELOW UPPER DAM FULTON, for the year ended June 30, 1919. Ed. L. Parker, H. H. Carlin and Bernard Malis, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	335.90	334.92	335.45	336.32	337.10	336.15	335.65	335.75	335.45	336.95	337.60	338.35
2.	335.45	335.15	335.52	336.65	336.80	336.20	335.88	336.05	336.25	336.95	337.70	338.00
3.	334.78	334.70	334.80	336.40	337.25	335.90	335.95	335.95	336.35	336.95	337.65	337.60
4.	335.78	335.60	335.00	336.32	337.15	335.80	335.80	335.60	335.70	336.95	338.10	337.05
5.	335.55	335.25	335.25	336.65	336.95	335.78	336.65	335.40	335.65	337.10	337.50	336.80
6.	334.95	334.80	335.10	336.30	337.05	335.70	336.15	334.80	335.70	337.80	337.25	336.40
7.	335.90	334.90	335.35	336.80	336.90	336.20	336.00	335.18	335.68	337.40	337.20	336.45
8.	335.60	335.05	335.52	336.55	336.85	336.35	335.85	335.20	335.50	337.30	337.40	337.10
9.	334.35	334.20	335.55	336.55	336.72	335.95	335.85	335.95	336.40	337.15	337.10	336.40
10.	334.15	335.00	335.10	336.38	336.88	335.72	335.60	335.70	336.55	337.50	337.00	336.60
11.	334.50	335.40	335.10	336.20	337.00	335.95	335.35	335.35	336.75	337.30	338.15	336.55
12.	334.78	335.30	335.50	336.75	336.60	335.75	336.00	335.35	336.85	337.85	338.30	336.70
13.	335.10	334.65	335.25	336.75	336.30	335.65	335.80	334.00	336.65	338.65	338.10	336.65
14.	335.95	334.85	335.45	336.75	336.15	336.00	335.70	334.40	336.35	338.45	338.25	336.70
15.	335.95	334.50	335.80	336.65	336.00	337.00	335.85	335.50	336.50	338.15	338.15	337.05
16.	334.70	334.50	335.78	336.39	335.88	336.50	335.30	336.05	336.90	338.00	337.75	336.30
17.	334.85	334.90	335.70	336.20	336.70	336.45	335.85	336.10	336.75	337.85	337.75	335.80
18.	334.95	335.48	335.72	336.25	336.95	336.35	335.20	335.40	336.75	337.80	338.05	335.75
19.	334.45	335.05	335.65	336.10	336.70	336.15	336.50	335.40	336.95	337.55	338.00	335.95
20.	334.95	334.90	336.02	336.40	336.72	336.00	335.82	335.40	337.00	337.95	337.55	335.60
21.	335.25	335.08	336.10	336.42	336.40	335.92	336.02	335.40	337.00	337.35	337.80	335.25
22.	335.45	334.80	336.62	336.28	336.45	336.80	335.45	335.40	336.98	337.15	337.65	336.15
23.	335.25	334.95	336.70	336.35	336.10	335.72	335.20	335.70	337.50	335.15	338.05	335.75
24.	334.95	335.00	336.28	336.15	336.70	336.50	335.75	335.95	337.10	337.20	338.50	335.45
25.	335.10	335.40	336.12	336.02	336.40	337.35	335.95	335.90	336.75	336.95	338.95	335.40
26.	335.25	335.15	336.48	336.52	335.80	336.85	336.68	335.65	336.85	337.25	338.70	335.50
27.	335.10	334.68	336.72	336.82	335.90	336.70	336.12	335.88	336.95	337.90	338.40	334.80
28.	335.30	335.12	336.50	337.15	335.28	336.45	335.82	335.50	336.60	337.55	338.40	334.90
29.	335.55	335.15	336.62	336.80	335.90	337.05	335.75	.....	336.50	337.35	338.20	336.00
30.	335.35	334.95	336.68	336.70	335.82	336.05	335.75	.....	337.35	337.60	338.26	335.70
31.	341.80	335.38	.....	337.00	.....	335.90	335.70	.....	337.20	.....	338.10	.....

OSWEGO RIVER ABOVE LOWER DAM, FULTON

Gage No. 174

This station was established December 9, 1909, to obtain water-surface elevations only. The record has been taken at one or the other of two gages, giving practically the same readings, i. e. gage No. 54 on west bank about 600 feet above the dam and gage No. 64 on east side of river about 700 feet above dam.

A direct-reading staff, located on the east side of the river on the retaining wall just inside the south end of the open docking approach above Barge canal lock No. 3, was replaced on August 10, 1916, by a standard Type B gage, No. 174, erected at the same location and having a range of 12 feet, between elevations 332.0 and 344.0. A standard bench-mark plug was set in the face of the wall at elevation 340.0 (B. C. datum).

The gage was read twice daily to half-tenths—at 6 A. M. and 6 P. M., July 1 to November 25 and May 6 to June 30, and at 8 A. M. and 4 P. M., November 26 to May 25.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER ABOVE LOWER DAM, FULTON, for the year ended June 30, 1919. H. H. Carlin, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	335.78	334.85	335.65	336.30	337.05	336.35	335.80	335.70	335.45	337.05	337.50	338.30
2.....	334.88	335.18	335.50	336.68	336.95	336.20	335.88	336.50	336.28	337.05	337.60	338.00
3.....	334.80	334.70	334.85	336.45	337.10	335.82	336.05	335.90	336.25	337.00	337.62	337.55
4.....	335.70	335.55	335.00	336.30	337.12	335.80	335.85	335.45	335.85	337.05	338.10	337.05
5.....	335.55	335.40	335.15	336.48	337.00	335.75	336.70	335.35	335.72	337.20	337.65	336.80
6.....	335.08	334.90	335.00	336.55	336.95	335.70	336.10	334.75	335.70	337.58	337.15	336.20
7.....	336.18	334.98	335.28	336.70	336.80	335.35	336.00	335.02	335.70	337.40	337.20	336.55
8.....	335.60	335.15	335.45	336.52	336.70	336.35	335.82	335.30	335.55	337.35	337.40	337.25
9.....	334.32	335.15	335.32	336.38	336.75	335.90	335.85	335.95	336.45	337.22	337.10	337.00
10.....	334.20	335.10	335.15	336.30	336.80	335.70	335.50	335.85	336.68	337.58	337.00	336.55
11.....	334.52	335.40	335.15	336.20	336.95	335.98	335.35	335.15	336.80	337.38	338.35	336.60
12.....	334.70	335.35	335.45	336.22	336.55	335.75	335.95	335.30	336.90	337.90	338.35	336.80
13.....	335.12	334.02	335.28	336.72	336.45	335.70	335.80	333.95	336.65	338.7	338.15	336.70
14.....	335.90	334.78	335.22	336.75	336.12	336.05	335.70	334.40	336.40	338.50	338.25	336.60
15.....	336.00	334.55	335.65	336.45	336.00	337.05	335.60	335.55	336.35	338.15	338.10	337.05
16.....	334.70	334.48	335.80	336.42	335.85	336.45	335.35	336.25	336.55	338.00	337.80	336.35
17.....	334.70	334.85	335.75	336.25	336.60	335.92	335.80	335.85	336.85	337.98	337.80	335.95
18.....	334.75	335.50	335.58	336.20	336.95	336.35	335.20	335.50	336.80	337.62	338.25	335.90
19.....	334.48	334.98	335.78	336.15	336.70	336.20	336.45	335.40	336.90	337.55	338.00	335.95
20.....	334.68	334.85	336.10	336.45	336.50	336.05	335.80	335.45	337.05	338.05	337.55	335.25
21.....	335.72	335.08	336.12	336.40	336.55	335.98	335.48	335.45	337.10	337.35	337.80	335.35
22.....	335.40	334.75	336.48	336.20	336.35	336.92	335.45	335.45	337.00	337.15	337.68	336.20
23.....	335.28	334.88	336.35	336.15	336.06	335.75	335.15	335.80	337.50	337.40	338.20	335.70
24.....	334.60	335.02	336.32	336.15	336.85	336.55	335.85	336.05	337.37	337.15	338.55	335.30
25.....	335.20	335.28	336.05	336.05	336.45	337.35	336.00	335.95	336.85	337.05	339.00	335.28
26.....	335.28	335.15	336.45	336.45	335.90	336.92	336.75	335.70	336.85	337.28	338.85	335.25
27.....	335.06	334.68	336.55	336.80	335.90	336.72	336.15	335.88	337.15	337.95	338.45	334.60
28.....	335.65	335.28	336.65	337.10	335.25	336.50	335.88	335.68	336.68	337.62	338.45	334.85
29.....	335.45	335.22	336.85	336.62	335.90	337.10	335.80	.....	336.85	337.38	338.10	336.00
30.....	335.30	335.10	336.75	336.65	335.35	336.00	335.70	.....	337.32	337.60	338.25	335.10
31.....	334.80	335.35	.....	336.88	.....	335.95	335.70	.....	337.18	.....	338.05	.....

OSWEGO RIVER BELOW LOWER DAM, FULTON

Gage No. 173

This station was established April 1, 1909, as gage No. 47 at end of east lower approach wall to and about 1,100 feet below Bargo canal lock No. 3. The gage is at present located on the east lower approach wall immediately below lock No. 3 and under the Oneida street bridge. A direct-reading staff was replaced on August 11, 1916, by a standard Type A gage, No. 173, in two sections, erected at the same location. The lower section has a range of 8 feet, between elevations 306.0 and 314.0, and the upper section has a range of 4 feet, between elevations 314.0 and 318.0. A standard bench-mark plug was set in the face of the wall near the upper section at elevation 317.0 (B. C. datum). The record obtained at these gages is the elevation of the river at its junction with the canal at the lower end of a dike separating the canal and river for a distance of about 3,500 feet below lock No. 3.

The gage was read twice daily to half-tenths—at 6 A. M. and 6 P. M., July 1 to November 25 and May 6 to June 30, and at 8 A. M. and 4 P. M., November 26 to May 25.

Daily elevation of water-surface (B. C. datum) of Oswego River below Lower Dam, Fulton, for the year ended June 30, 1919. H. H. Carlin, Observer.

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	308.5	308.05	307.85	308.3	309.35	308.15	308.45	309.1	308.35	309.8	310.7	310.85
2.....	308.25	308.08	307.9	308.5	308.9	308.65	308.55	308.95	308.15	309.65	310.9	310.85
3.....	307.95	308.05	308.0	308.35	308.9	308.55	308.6	308.55	308.8	309.6	311.0	310.7
4.....	307.95	308.0	308.0	308.45	308.9	308.65	308.55	308.32	308.62	309.8	310.4	309.65
5.....	308.0	308.0	308.05	308.5	309.1	308.48	308.55	308.35	308.6	310.2	310.0	308.85
6.....	308.0	307.9	308.0	308.35	308.85	308.48	309.25	308.35	308.5	309.8	310.25	308.7
7.....	308.0	307.98	308.1	308.5	308.95	308.55	308.9	308.3	308.55	310.5	310.05	308.9
8.....	308.15	308.05	307.9	308.45	309.1	308.6	308.45	308.3	308.4	310.4	310.15	308.65
9.....	308.0	308.15	307.95	308.45	308.75	308.7	308.55	308.4	308.2	310.3	309.75	308.75
10.....	307.9	308.0	307.95	308.5	308.65	308.5	308.9	308.6	309.05	310.7	309.45	308.95
11.....	308.05	308.05	308.0	308.45	308.7	308.6	308.5	308.3	309.35	310.7	310.9	308.7
12.....	308.15	307.95	307.95	308.4	308.55	308.5	308.25	308.3	309.6	311.5	311.25	309.1
13.....	308.1	308.1	308.0	308.6	308.55	308.42	309.02	308.3	309.35	311.6	311.4	309.2
14.....	308.0	308.05	308.0	308.7	308.65	308.5	308.75	308.3	308.9	312.45	311.6	308.75
15.....	308.2	307.95	307.85	308.7	308.5	308.5	308.7	308.4	308.75	312.15	311.45	308.65
16.....	308.2	307.95	308.0	308.55	308.4	309.05	308.55	308.3	308.9	311.8	310.7	308.55
17.....	308.15	308.05	308.15	308.5	308.42	309.55	308.7	308.6	309.2	311.65	310.75	309.5
18.....	308.12	307.95	308.0	308.3	309.0	309.15	308.5	308.25	309.35	311.4	310.75	308.6
19.....	308.15	307.95	308.05	308.25	309.08	308.75	308.4	308.45	309.6	311.0	310.75	308.6
20.....	308.1	308.0	308.15	308.25	309.1	308.6	308.75	308.45	309.85	310.25	310.5	308.15
21.....	307.88	307.9	308.2	308.5	308.85	308.55	308.4	308.25	309.85	310.5	311.0	308.2
22.....	308.18	307.95	308.2	308.45	308.75	308.6	308.42	308.2	309.65	310.05	311.1	308.2
23.....	308.18	307.95	308.45	308.4	308.52	308.5	308.3	308.05	308.5	310.15	312.15	308.05
24.....	308.18	308.0	308.45	308.35	308.55	308.9	308.65	308.32	309.65	310.3	312.2	308.05
25.....	308.15	307.85	308.15	308.45	308.45	308.85	309.35	308.25	309.12	310.0	312.55	308.1
6.....	308.2	307.8	308.45	308.6	308.5	309.45	308.4	308.35	309.0	310.0	312.2	308.05
7.....	308.05	308.0	308.4	308.6	308.48	309.22	308.55	308.4	309.25	310.2	312.05	308.15
8.....	308.1	307.85	308.4	308.75	308.15	308.9	308.45	308.35	309.5	310.45	312.0	308.2
9.....	308.15	307.95	308.45	308.8	308.5	308.45	308.45	.....	309.05	310.5	311.45	308.05
0.....	308.2	307.95	308.55	308.85	308.45	308.8	308.4	.....	308.8	310.95	311.35	308.2
1.....	308.0	308.0	.....	309.05	.....	308.6	308.5	.....	309.9	.....	311.2	.....

OSWEGO RIVER AT MINETTO

Gages Nos. 171 and 172

At Minetto a new curved dam (No. 5) with fixed concrete ogee crest 500 feet long at elevation 308.0, radius 192 feet, has been built immediately above the old straight dam, crest elevation 297.3, which has been removed. The upper pool was raised and water first flowed over new crest October 5, 1914.

Location.—In the village of Minetto at new Barge canal dam No. 5, about five miles above the mouth of the Oswego river.

Drainage area.—5,091 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Water-surface elevations above and below old or new dam, April 18, 1904, to June 30, 1919. Discharge, October 1, 1914, to June 30, 1919.

Gages.—Above dam, until August 18, 1916, direct-reading staff on wing of retaining wall, west bank, about 400 feet upstream from dam. Since August 18, a standard Type A gage, No. 172, erected at the end of upper east gate recess of lock No. 5, and having a range of 11½ feet, between elevations 304.0 and 315.5. A standard bench-mark plug was set in the wall near the gage at elevation 314.0 (B. C. datum).

Below dam, until August 18, 1916, concrete gage just below lower gates of lock No. 5. Since August 18, a standard Type B gage, No. 171, erected on the end of the lower west approach wall to lock No. 5, and having a range of 12 feet, between elevations 288.0 and 300.0. A standard bench-mark plug was set in the wall near the gage at elevation 296.0 (B. C. datum).

These gages were read twice daily to tenths—at 8 A. M. and 4 P. M., July 1 to May 6, and at 6 A. M. and 6 P. M., May 7 to June 30.

Discharge measurements.—Flow over crest and through power-wheels calculated from hourly readings furnished by the Niagara, Lockport and Ontario Power Company, lessee. Wheels not tested in place. Discharge over dam from curve prepared by this Department. During lower stages the power-plant uses all water available, the pool being drawn down to crest of dam. Water used for canal purposes estimated by this Department.

Control.—Dam crest, Barge canal lock No. 5 and power-plant of the Northern New York Power Company. The latter started testing wheels September 8, 1915.

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 87

Extremes of discharge.— Current year: Maximum mean daily discharge, 16,000 second-feet on May 26. Minimum mean daily discharge, 350 second-feet on September 1.

1915-1919: Maximum stage recorded, elevation 313.35, April 5, 1916; discharge, 30,900 second-feet. Minimum stage recorded, September 1, 1918; discharge, 350 second-feet.

Regulation.— By the large number of lakes in the drainage area and by pondage at Fulton and Phoenix.

Accuracy.— It is believed that the water passed through the wheels is somewhat underestimated, due to the lack of actual tests of wheels in place, but that the estimated discharge at this station is nearer correct than that obtained at High dam, which is based on only one or two daily readings.

Coöperation.— Discharge data furnished as above by the Niagara, Lockport and Ontario Power Company.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER ABOVE DAM AT MINETTO, for the year ended June 30, 1919. H. M. Searles, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	308.0	308.0	308.0	308.05	308.2	308.0	308.1	308.8	308.15	308.9	309.45	309.7
2.....	308.05	308.1	308.0	308.1	308.15	308.1	308.1	308.65	308.15	308.75	309.85	309.8
3.....	308.0	308.05	308.1	308.15	308.1	308.15	308.05	308.15	308.2	308.65	309.9	309.55
4.....	308.05	308.0	308.0	308.0	308.45	308.25	308.05	308.1	308.25	308.9	309.4	308.75
5.....	308.1	308.1	308.1	308.05	308.25	308.05	308.05	308.0	308.1	309.2	309.45	308.15
6.....	308.05	308.0	308.05	308.1	308.2	308.05	308.1	308.0	308.15	309.05	309.45	308.15
7.....	308.0	308.05	308.05	308.15	308.25	308.2	308.1	308.05	308.15	309.4	309.15	308.2
8.....	308.05	308.0	308.05	308.1	308.1	308.05	308.2	308.1	308.15	309.35	309.1	308.15
9.....	308.0	308.15	308.1	308.1	308.1	308.1	308.15	308.05	308.1	309.2	308.85	308.15
10.....	308.05	308.1	308.0	308.05	308.05	308.1	308.1	308.1	308.2	309.65	308.55	308.2
11.....	308.05	308.05	308.05	308.15	308.05	308.1	308.1	308.15	308.5	309.6	309.8	308.1
12.....	308.05	308.1	308.05	308.15	308.15	308.1	308.05	308.05	308.9	310.25	310.1	308.3
13.....	308.05	308.1	308.1	308.15	308.05	308.1	308.0	308.05	308.4	310.25	310.15	308.45
14.....	308.0	308.1	308.0	308.25	308.05	308.15	308.05	308.15	308.15	310.9	310.3	308.1
15.....	308.15	308.1	308.0	308.05	308.1	308.05	308.05	308.1	308.15	310.8	310.25	308.05
16.....	308.05	308.1	308.1	308.1	308.0	308.3	308.05	308.05	308.1	310.6	309.85	308.0
17.....	308.15	308.05	308.05	308.05	308.05	308.65	308.05	308.25	308.4	310.35	309.65	308.05
18.....	308.05	308.0	308.05	308.05	308.35	308.4	308.05	308.15	309.3	310.1	309.6	308.1
19.....	308.05	308.05	308.05	308.0	308.2	308.2	308.1	308.15	309.2	309.85	309.7	308.0
20.....	308.0	308.0	308.1	308.05	308.25	308.1	308.05	308.25	308.95	309.35	309.55	308.1
21.....	308.0	308.05	308.1	308.05	308.1	308.1	308.1	308.1	308.85	309.4	309.85	308.0
22.....	308.15	308.05	308.1	308.05	308.15	308.1	308.05	308.1	308.65	309.1	310.0	308.0
23.....	308.1	308.05	308.15	308.05	308.05	308.1	308.05	308.0	308.15	309.25	311.1	308.0
24.....	308.05	308.0	308.05	308.1	308.0	308.15	308.1	308.2	308.75	309.25	310.8	308.05
25.....	308.05	308.0	308.05	308.1	308.0	308.1	308.8	308.05	308.3	308.95	311.25	308.1
26.....	308.05	308.05	308.0	308.1	308.1	308.5	308.15	308.15	308.25	308.85	310.75	308.0
27.....	308.1	308.0	308.2	308.15	308.1	308.35	308.15	308.1	308.35	309.05	310.7	308.1
28.....	308.05	308.1	308.05	308.1	308.1	308.15	308.1	308.15	308.6	309.3	310.7	308.0
29.....	308.1	308.05	308.05	308.15	308.1	308.05	308.1	.....	308.1	309.45	310.25	308.0
30.....	308.1	308.05	308.05	308.1	308.15	308.1	308.1	.....	308.15	309.8	310.15	308.15
31.....	308.1	308.0	.....	308.2	.....	308.05	308.05	.....	308.9	.....	309.95	.....

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER BELOW DAM AT MINETTO, for the year ended June 30, 1919. H. M. Searles, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	292.3	291.55	291.0	292.15	292.95	291.65	292.35	291.9	292.25	293.35	293.8	294.0
2.....	292.3	291.55	291.2	292.2	293.15	292.35	292.35	291.8	291.75	293.25	294.0	294.0
3.....	291.55	291.35	291.4	292.4	292.7	292.35	292.5	292.25	292.65	293.2	293.9	293.9
4.....	291.25	290.95	291.35	292.1	292.7	292.1	292.5	292.1	292.55	293.35	293.7	293.35
5.....	292.0	291.8	291.5	292.15	293.0	292.3	292.25	292.15	292.5	293.5	293.75	292.8
6.....	291.65	291.4	291.35	291.85	293.05	292.2	292.7	292.1	292.45	293.4	293.75	292.7
7.....	291.85	291.65	291.35	292.4	292.7	292.05	292.7	292.15	292.3	293.65	293.55	292.95
8.....	291.95	291.4	290.75	292.45	292.55	291.95	292.55	291.95	292.2	293.6	293.5	291.85
9.....	291.85	291.45	291.6	292.35	292.65	292.4	292.5	291.4	291.75	293.45	293.4	291.35
10.....	291.65	291.5	291.35	292.35	292.25	292.4	292.4	292.35	292.95	293.75	293.15	292.9
11.....	291.9	290.8	291.5	292.15	292.55	292.3	292.35	292.25	293.1	293.75	293.95	292.85
12.....	292.05	291.85	291.4	292.15	292.85	292.35	291.85	292.05	293.35	294.2	294.2	92.55
13.....	292.0	291.75	291.55	292.15	292.7	292.2	292.6	291.95	293.15	294.35	294.3	293.1
14.....	291.4	291.5	291.45	292.45	292.55	292.3	292.4	291.8	291.0	291.8	294.35	92.65
15.....	292.3	291.35	290.95	292.55	292.65	292.45	292.4	292.2	292.8	294.65	294.3	292.7
16.....	291.9	291.35	291.6	292.45	292.45	292.85	292.35	291.7	292.4	294.5	294.55	292.65
17.....	292.1	291.6	291.5	292.35	292.3	293.25	292.3	292.25	293.05	294.15	293.95	291.7
18.....	291.95	290.9	291.8	292.25	292.95	293.05	292.25	292.15	293.05	294.2	294.9	292.55
19.....	291.8	291.65	291.65	292.05	293.0	292.75	292.4	292.05	293.25	294.05	293.9	292.6
20.....	291.7	291.55	292.05	291.05	293.0	292.6	292.5	292.0	293.4	293.7	293.8	292.3
21.....	291.3	291.6	292.25	292.4	292.65	292.55	292.45	291.95	293.35	293.7	294.0	292.0
22.....	292.0	291.4	291.75	292.35	293.05	292.5	292.25	291.95	293.25	293.45	294.0	291.95
23.....	292.0	291.3	292.15	292.25	292.55	292.55	292.2	291.4	293.05	293.5	294.75	291.9
24.....	291.75	291.55	291.9	292.3	292.15	292.75	292.5	292.3	293.3	293.65	294.7	292.0
25.....	292.05	290.75	291.85	292.25	292.65	292.8	292.55	292.15	293.05	293.4	291.7	292.05
26.....	292.05	291.3	292.2	292.5	292.35	293.15	292.25	292.2	293.2	293.35	294.55	291.9
27.....	291.85	291.4	292.15	292.35	292.35	293.1	292.55	292.3	293.15	293.55	294.7	291.95
28.....	291.0	291.5	292.2	292.6	292.0	292.95	292.5	292.15	293.25	293.65	294.6	291.9
29.....	291.85	291.5	292.05	292.55	292.3	292.65	292.45	.....	292.95	293.05	294.35	291.55
30.....	291.7	291.4	292.5	292.45	292.05	292.8	292.45	.....	292.5	293.95	294.9	292.15
31.....	291.75	291.4	.....	293.0	.....	292.55	292.35	.....	293.35	.....	294.2	.....

Daily discharge, in second-feet, of OSWEGO RIVER AT MINETTO, for the year ended June 30, 1919

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	4,460	2,750	350	4,400	7,090	3,180	4,380	4,250	4,400	7,740	9,450	11,200
2.....	4,180	2,570	1,400	4,650	6,050	4,050	4,780	4,000	3,640	7,750	10,400	12,000
3.....	3,040	2,470	1,960	4,430	6,320	4,510	5,290	5,010	5,180	7,590	10,600	10,900
4.....	2,070	1,420	1,990	4,070	6,410	4,680	5,160	4,050	7,730	8,060	9,220	8,880
5.....	3,280	2,590	2,100	4,180	6,460	3,630	5,250	3,910	4,950	8,970	9,410	6,630
6.....	3,390	2,460	2,040	3,630	6,240	4,080	5,240	3,810	4,770	8,580	9,030	5,790
7.....	2,540	2,330	2,170	4,850	5,910	3,830	5,180	3,720	4,890	9,100	9,420	5,880
8.....	3,300	2,260	1,160	4,530	5,740	3,610	4,030	3,920	4,470	9,020	8,560	5,700
9.....	2,680	2,670	2,020	4,670	5,760	4,540	5,160	2,970	4,360	8,600	8,770	6,280
10.....	2,500	2,840	2,300	4,500	4,550	4,490	4,200	4,330	6,580	9,820	7,710	6,590
11.....	2,860	1,340	2,200	4,340	4,870	4,730	4,220	3,960	7,290	9,820	10,100	6,280
12.....	3,450	2,780	2,470	4,530	5,010	4,450	2,910	3,680	7,770	12,000	11,900	6,970
13.....	3,860	2,840	2,410	4,710	5,200	4,180	4,400	3,350	7,200	12,900	12,000	6,600
14.....	2,220	2,410	2,580	4,910	4,760	5,000	4,250	3,270	6,510	15,600	12,600	6,010
15.....	4,130	2,000	1,390	4,790	4,110	5,660	4,530	4,180	6,280	14,800	12,400	5,170
16.....	3,400	2,040	2,710	4,560	4,360	5,990	4,230	3,220	5,640	13,800	10,600	5,390
17.....	3,400	1,770	2,860	4,250	4,330	6,190	4,200	4,810	6,970	13,000	10,800	5,750
18.....	3,440	480	2,970	4,100	6,190	5,810	4,060	4,050	7,370	12,100	9,730	5,100
19.....	3,170	1,590	2,820	3,830	6,110	5,820	3,910	3,840	7,820	11,400	11,600	5,220
20.....	3,060	1,920	3,510	3,610	6,410	5,420	4,250	3,910	8,220	9,450	11,000	4,400

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 89

Daily discharge, in second-feet, of OSWEGO RIVER AT MINETTO, for the year ended June 30, 1919 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	1,960	1,700	3,690	4,540	6,000	5,090	4,550	3,680	8,170	10,300	11,960	8,790
22.....	3,520	1,620	3,520	3,860	5,650	5,440	4,270	3,810	7,820	8,460	12,200	2,660
23.....	3,360	1,620	4,160	4,240	5,180	5,760	4,240	2,520	7,370	8,380	11,600	2,900
24.....	2,920	1,740	4,030	4,240	4,500	5,380	5,220	3,870	7,420	8,930	15,600	3,650
25.....	3,410	630	3,760	4,080	5,000	6,160	5,520	4,180	7,020	8,260	15,600	3,740
26.....	2,700	1,270	4,540	4,950	4,370	7,420	4,760	4,650	8,820	8,490	16,000	3,760
27.....	3,060	1,370	4,320	5,000	4,420	6,550	5,210	4,080	7,450	8,570	15,500	3,300
28.....	1,750	1,280	4,560	5,420	3,980	6,400	4,940	4,280	6,950	8,940	15,700	3,220
29.....	3,180	1,250	4,170	5,360	4,460	5,430	4,850	.....	6,310	9,240	13,800	2,610
30.....	3,100	1,210	4,750	5,150	4,070	5,330	4,800	.....	6,380	11,400	13,000	4,120
31.....	2,870	1,310	.....	5,890	.....	4,600	4,770	.....	7,900	.....	12,400	.....
Mean ..	3,104	1,889	2,841	4,527	5,319	5,082	4,610	3,905	6,503	10,036	11,569	5,719

Monthly discharge of OSWEGO RIVER AT MINETTO, for the year ended June 30, 1919
[Drainage area, 5,091 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	4,460	1,750	3,104	0.609	0.70
August.....	2,840	480	1,889	0.371	0.43
September.....	4,750	350	2,831	0.566	0.62
October.....	5,890	3,610	4,527	0.899	1.02
November.....	7,080	3,080	5,319	1.045	1.17
December.....	7,420	3,180	5,082	0.908	1.15
January.....	5,520	2,940	4,640	0.911	1.05
February.....	5,010	2,520	3,905	0.767	0.80
March.....	8,220	3,840	6,503	1.277	1.47
April.....	15,600	7,560	10,036	1.971	2.20
May.....	16,000	7,710	11,569	2.272	2.62
June.....	12,000	2,610	5,719	1.123	1.26
The year.....	16,000	350	5,427	1.066	14.48

OSWEGO RIVER AT NEW HIGH DAM, OSWEGO

Gage No. 170

High dam (old) with fixed crest at about elevation 281.8 has been removed above elevation 268.0, having been submerged by the pool formed by new High dam (dam No. 6) located about a mile farther downstream with fixed concrete ogee crest 500 feet long at elevation 290.0. The new pool was filled January 7, 1915.

Location.—At Barge canal dam No. 6, known as new High dam, just south of the city of Oswego and about 2 miles above the mouth of the Oswego river.

Drainage area.—5,097 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Water-surface elevation above and below, January 1, 1915, to June 30, 1919. Discharge, January 7, 1915, to June 30, 1919.

Gages.—Above dam, until August 17, 1916, direct-reading staff on wing of east upper approach wall to lock No. 6, about 350 feet upstream from crest of dam. Since August 17, a standard Type B gage, No. 170, erected at the same location and having a range of 12 feet, between elevations 286.0 and 298.0. A standard bench-mark plug was set in the wall at elevation 296.0 (B. C. datum).

Below dam, until August 17, 1916, a direct-reading staff on wing of each lower approach wall to lock No. 6. Since August 17, a standard Type B gage, No. 169, erected at the same location and having a range of 12 feet, between elevations 265.0 and 277.0. A standard bench-mark plug was set in the face of the wall near the gage at elevation 274.0 (B. C. datum).

These gages were read twice daily to half-tenths—at 6 A. M. and 6 P. M., July 1 to November 25 and May 6 to June 30, and at 8 A. M. and 4 P. M., November 26 to May 5.

Discharge measurements.—Except the small amount required for canal purposes, the entire flow of the river ordinarily passes over the dam. Water used for canal purposes is included.

Control.—Crest, Barge canal lock No. 6 and bulkhead gates.

Extremes of discharge.—Current year: Maximum mean daily discharge, 19,200 second-feet on April 14. Minimum mean daily discharge, 1,680 second-feet on September 8.

1915-1919: Maximum stage recorded, elevation 296.3 on April 3, 4 and 5, 1916; discharge, 31,400 second-feet. Minimum stage recorded, elevation 287.2 on December 16, 1915, at 10 A. M.

Regulation.—By the large number of lakes in the drainage area and by pondage at Fulton and Phoenix.

Accuracy.—The one or two daily readings are not a sufficient basis for accurate discharge estimates, owing to the fluctuation

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 91

of flow caused by pondage and industrial wheels at Fulton and Phoenix. It is believed that the estimated discharge at this station is too high and that those obtained at Minetto, while possibly a little low, are nearer correct.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER ABOVE NEW HIGH DAM, OSWEGO, for the year ended June 30, 1919. James R. Kelly, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	292.15	291.58	291.10	292.05	292.85	291.60	292.40	291.85	292.20	293.25	293.50	293.70
2.....	292.10	291.48	291.12	292.32	292.68	292.30	292.45	292.30	291.60	293.20	293.80	293.70
3.....	291.82	291.65	291.25	292.20	292.80	292.30	292.60	292.30	292.55	293.15	293.65	293.60
4.....	291.55	291.12	291.35	292.12	292.88	292.25	292.50	292.15	292.45	293.25	293.55	293.15
5.....	291.72	291.38	291.52	292.02	292.90	292.10	292.10	292.10	292.45	293.40	293.50	292.80
6.....	291.95	291.50	291.45	292.35	292.80	292.20	292.50	292.10	292.40	293.25	293.40	292.60
7.....	291.75	291.58	291.22	292.28	292.78	292.05	292.50	292.15	292.30	293.55	293.35	292.70
8.....	291.92	291.52	290.98	292.35	292.72	291.80	292.40	291.95	292.15	293.50	293.35	292.65
9.....	291.62	291.68	291.10	292.30	292.68	292.35	292.30	291.60	291.90	293.40	293.20	292.70
10.....	291.55	291.72	291.45	292.12	292.50	292.35	292.20	292.25	292.75	293.60	293.10	292.80
11.....	291.58	291.62	291.50	292.15	292.35	292.40	292.15	292.05	293.00	293.65	293.80	292.70
12.....	291.88	291.40	291.40	292.05	292.25	292.25	291.65	291.90	293.15	294.05	294.00	292.95
13.....	291.85	291.50	291.50	292.22	292.50	292.25	292.35	291.90	293.00	294.10	294.00	293.05
14.....	291.55	291.70	291.35	292.55	292.25	292.32	292.20	291.85	292.85	294.55	293.90	292.55
15.....	291.90	291.70	291.18	292.38	292.18	292.35	292.25	292.40	292.70	294.40	294.00	292.65
16.....	291.98	291.65	291.48	292.28	292.32	292.70	292.20	291.65	292.35	294.30	293.70	292.50
17.....	291.70	291.38	291.65	292.12	292.22	292.70	292.20	292.15	292.95	294.10	293.70	292.55
18.....	291.68	291.05	291.95	292.25	292.72	292.95	292.15	292.10	292.85	294.00	293.60	292.50
19.....	291.88	291.20	291.82	292.10	292.85	292.60	291.70	292.00	293.20	293.75	293.70	292.50
20.....	291.60	291.50	292.00	292.02	292.85	292.55	292.30	292.00	293.25	293.45	293.60	292.10
21.....	291.55	291.38	292.10	292.02	292.68	292.45	292.30	292.00	293.20	293.45	293.75	291.95
22.....	291.82	291.38	292.02	292.12	292.65	292.45	292.15	292.00	293.00	293.30	293.65	291.85
23.....	291.85	291.45	292.12	292.15	292.50	292.15	292.10	291.30	293.00	293.40	294.15	292.00
24.....	291.55	291.40	292.05	292.08	292.25	292.75	292.45	292.30	293.00	293.40	294.45	292.00
25.....	291.62	291.12	291.82	292.12	292.50	292.75	292.45	292.10	293.00	293.25	294.45	291.90
26.....	291.55	291.15	292.18	292.32	292.20	293.05	292.20	292.15	292.90	293.20	294.45	291.85
27.....	291.78	291.25	292.10	292.38	292.25	293.05	292.45	292.20	293.00	293.30	294.40	291.90
28.....	291.45	291.45	292.05	292.60	292.20	292.95	292.40	292.10	293.00	293.50	294.30	291.85
29.....	291.55	291.42	292.25	292.70	292.25	292.55	292.40	.....	292.75	293.55	294.05	291.65
30.....	291.80	291.45	292.35	292.45	292.15	292.55	292.40	.....	292.70	293.75	293.95	292.00
31.....	291.80	291.32	.....	292.72	.....	292.55	292.25	.....	293.20	.....	293.95	.....

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER BELOW NEW HIGH DAM, OSWEGO, for the year ended June 30, 1919. James R. Kelly, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	270.05	269.20	268.92	269.92	270.62	269.65	270.20	269.40	270.00	271.20	271.30	272.05
2.....	269.70	269.12	268.98	270.25	270.52	270.00	270.00	270.20	270.00	271.90	271.90	271.95
3.....	269.50	269.42	269.00	270.08	270.75	269.90	270.10	270.00	270.35	271.95	271.80	271.70
4.....	269.38	269.05	269.05	270.05	270.68	269.60	270.35	271.35	270.30	271.10	271.75	271.20
5.....	269.48	269.15	269.08	269.98	270.70	269.65	270.10	269.65	270.15	271.35	271.40	270.75
6.....	269.78	269.28	269.08	270.00	270.30	269.80	270.30	269.60	270.25	271.35	271.40	270.65
7.....	269.60	269.40	269.05	270.30	270.68	269.50	270.20	269.70	270.00	271.40	271.40	270.65
8.....	269.65	269.05	268.88	270.25	270.55	269.68	269.95	269.65	269.90	271.40	271.35	270.75
9.....	269.18	269.40	268.70	270.10	270.55	269.80	269.80	269.40	269.85	271.25	271.30	270.70
10.....	269.32	269.45	269.00	269.80	270.42	269.85	269.75	269.75	270.50	271.55	271.15	270.75

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER BELOW NEW HIGH DAM, OSWEGO, for the year ended June 30, 1919. James R. Kelly, Observer — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	269.18	269.60	269.05	269.95	270.35	269.75	269.80	269.55	270.75	271.55	272.00	270.65
12.....	269.45	269.25	269.15	270.00	269.95	269.80	269.65	269.45	270.95	272.10	271.75	270.65
13.....	269.62	269.25	269.12	270.55	270.28	269.65	269.95	269.50	270.80	272.40	272.05	271.00
14.....	269.26	269.32	269.10	270.58	270.40	269.60	269.80	269.90	270.65	272.45	272.20	270.60
15.....	269.90	269.40	269.05	270.50	270.00	270.40	269.75	270.15	270.60	272.35	272.25	270.90
16.....	269.60	269.28	269.32	270.38	270.05	270.45	269.70	269.55	270.35	272.30	272.00	270.55
17.....	269.50	269.12	269.22	270.22	270.25	270.40	269.75	269.70	270.40	272.20	271.80	270.50
18.....	269.52	268.88	269.65	270.35	270.55	270.70	269.80	269.60	270.60	272.00	271.85	270.35
19.....	269.50	269.00	269.48	270.22	270.68	270.30	269.70	269.50	270.90	272.10	271.85	270.40
20.....	269.28	269.08	269.68	270.20	270.60	270.40	269.80	269.45	271.05	271.60	271.55	269.95
21.....	269.40	269.10	269.68	270.02	270.40	270.35	269.90	269.55	271.10	271.40	271.85	269.75
22.....	269.65	269.10	270.05	270.12	270.50	270.05	269.70	269.65	271.10	271.20	271.70	269.90
23.....	269.62	269.06	269.95	270.05	270.32	269.90	269.70	269.20	271.10	271.25	272.35	269.90
24.....	269.22	269.20	269.68	270.00	270.35	270.40	270.05	269.90	270.85	271.30	272.75	269.70
25.....	269.25	269.05	269.58	270.02	270.30	270.75	270.15	269.60	270.75	271.20	272.75	269.65
26.....	269.15	268.85	269.95	270.20	269.80	270.65	270.20	269.65	270.70	271.15	272.55	269.50
27.....	269.70	268.55	269.85	270.48	269.80	270.70	270.15	269.90	270.75	271.50	272.50	269.65
28.....	269.52	269.15	269.95	270.42	269.85	270.65	270.10	269.80	270.90	271.35	272.40	269.65
29.....	269.50	268.95	270.25	270.55	269.90	270.45	270.05	.....	270.55	271.40	272.15	269.65
30.....	269.65	269.05	270.20	270.20	269.85	270.15	270.10	.....	270.75	271.65	272.20	270.00
31.....	269.50	269.00	.....	270.18	.....	270.00	269.90	.....	271.00	.....	272.20	.....

Daily discharge, in second-feet, of OSWEGO RIVER AT NEW HIGH DAM, OSWEGO, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	5,950	3,640	2,040	5,530	9,320	3,720	7,080	4,680	6,170	11,400	12,800	14,000
2.....	5,740	3,280	2,100	6,730	8,460	6,620	7,320	6,620	3,710	11,200	14,600	14,000
3.....	4,560	3,900	2,500	6,180	9,060	6,630	8,040	6,620	7,800	10,900	13,700	13,400
4.....	3,530	2,090	2,810	5,840	9,470	6,400	7,560	5,950	7,320	11,400	13,100	10,900
5.....	4,170	2,940	3,420	5,400	9,570	5,730	5,730	5,730	7,320	12,300	12,800	9,000
6.....	5,100	3,350	3,170	6,870	9,060	6,170	7,560	5,730	7,080	11,400	12,300	8,050
7.....	4,290	3,650	2,400	6,540	8,960	5,520	7,560	5,950	6,620	13,100	13,000	8,550
8.....	4,970	3,420	1,680	6,870	8,650	4,480	7,080	5,090	5,950	12,800	13,000	8,300
9.....	3,780	4,020	2,030	6,640	8,460	6,860	6,620	3,710	4,880	12,300	11,200	8,540
10.....	3,530	4,170	3,170	5,840	7,580	6,860	6,170	6,390	8,790	13,400	10,600	9,000
11.....	3,600	3,790	3,350	5,960	6,870	7,080	5,950	5,510	10,100	13,700	14,600	8,540
12.....	4,810	3,000	2,990	5,540	6,410	6,390	3,890	4,880	10,900	16,100	15,800	9,830
13.....	4,680	3,360	3,350	6,280	7,580	6,390	6,850	4,880	10,100	16,400	15,800	10,300
14.....	3,530	4,090	2,820	7,820	6,420	6,710	6,170	4,080	9,300	19,200	15,200	7,810
15.....	4,890	4,090	2,270	7,010	6,100	6,850	6,390	7,080	8,540	18,200	15,800	8,300
16.....	5,230	3,900	3,280	6,540	6,740	8,540	6,170	3,890	6,850	17,600	14,000	7,570
17.....	4,090	2,930	3,900	5,850	6,290	8,540	6,170	5,950	9,820	16,400	14,000	7,800
18.....	4,020	1,900	5,100	6,410	8,660	9,820	5,950	5,730	9,300	15,800	13,400	7,590
19.....	4,800	2,340	4,560	5,750	9,320	8,040	4,080	5,300	11,200	14,300	14,000	7,570
20.....	3,710	3,350	5,310	5,400	9,320	7,800	6,620	5,300	11,400	12,500	13,400	5,730
21.....	3,530	2,930	5,730	5,400	8,460	7,320	6,620	5,300	11,200	12,500	14,300	5,100
22.....	4,580	2,930	5,390	5,840	8,320	7,320	5,950	5,300	10,100	11,700	13,700	4,680
23.....	4,690	3,170	5,820	5,960	7,590	5,950	5,730	2,660	10,100	12,300	16,700	5,300
24.....	3,530	3,060	5,520	5,660	6,410	8,790	7,320	6,620	10,100	12,300	18,600	5,320
25.....	3,780	2,100	4,560	5,840	7,590	8,790	7,320	5,730	10,100	11,400	18,600	4,890
26.....	3,540	2,180	6,080	6,730	6,190	10,300	6,170	5,950	9,560	11,200	18,600	4,680
27.....	4,420	2,500	5,730	7,010	6,420	10,300	7,320	6,170	10,100	11,700	18,300	4,900
28.....	3,170	3,170	5,520	8,090	6,200	9,820	7,080	5,730	10,100	12,800	17,600	4,690
29.....	3,540	3,070	6,400	8,550	6,420	7,800	7,080	.....	8,790	13,100	16,100	3,900
30.....	4,480	3,180	6,850	7,340	5,980	7,800	7,080	.....	8,540	14,300	15,500	5,310
31.....	4,480	2,730	.....	8,650	.....	7,800	6,390	.....	11,200	.....	15,500	.....
Mean...	4,283	3,167	3,996	6,453	7,720	7,327	6,540	5,460	8,800	13,457	14,720	7,788

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 93

Monthly discharge of OSWEGO RIVER AT NEW HIGH DAM, OSWEGO, for the year ended June 30, 1919
[Drainage area, 5,097 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	5,950	3,170	4,233	0.840	0.97
August.....	4,170	1,900	3,167	0.621	0.72
September.....	6,850	1,680	3,996	0.784	0.87
October.....	8,650	5,460	6,453	1.266	1.46
November.....	9,570	5,980	7,729	1.516	1.69
December.....	10,300	3,720	7,327	1.438	1.66
January.....	8,040	3,890	6,549	1.285	1.48
February.....	7,080	2,680	5,469	1.073	1.12
March.....	11,400	3,710	8,806	1.728	1.99
April.....	19,200	10,990	13,457	2.640	2.94
May.....	18,600	10,600	14,729	2.890	3.33
June.....	14,000	3,900	7,788	1.528	1.70
The year.....	19,200	1,680	7,480	1.468	19.93

OSWEGO RIVER ABOVE CURVED DAM, OSWEGO

Gage No. 2

The record heretofore published as "Oswego River above Curved Dam" is that obtained at gage No. 2 on the west side of the river. This gage was established April 7, 1904, and until December 10, 1916, consisted of a staff gage secured to the north face of the third pier south of, and part of, the upper approach to the Varick canal lock at the west end of the curved dam at Oswego. Since December 12, 1916, a standard Type A gage in the same location has been used. This gage has a range of 10 feet, between elevations 266.0 and 276.0 (B. C. datum), and is read once daily. It indicates the water-surface about 100 feet above the dam.

This gage should not be confused with the gage at the east end of the dam, whose record is published as "Oswego River, East Side, above Curved Dam, Oswego."

This gage is read once daily—at 8 A. M.—to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER, ABOVE CURVED DAM, OSWEGO, for the year ended June 30, 1919. D. D. Tompkins, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	269.7	268.7	269.2	270.0	270.5	269.7	270.1	268.2	270.0	271.3	271.4
2.....	269.5	268.8	269.0	270.0	270.5	269.9	270.0	269.3	270.0	270.8	271.9
3.....	268.3	268.3	267.8	270.0	270.8	269.7	270.1	269.5	269.9	270.8	271.7
4.....	268.7	268.9	268.4	269.8	270.5	269.7	270.0	269.5	270.4	271.0	271.7
5.....	269.0	269.8	269.0	269.9	270.5	269.7	270.0	269.6	270.3	271.3	271.5
6.....	269.0	269.4	268.0	269.9	270.5	269.7	269.7	269.6	270.1	271.4	271.3
7.....	269.6	268.0	269.0	270.0	270.2	269.8	270.0	269.5	269.9	271.0	271.3
8.....	269.5	268.5	268.7	270.2	270.2	269.8	269.8	269.6	269.9	271.3	271.3
9.....	269.0	268.9	268.9	270.0	270.2	269.7	270.0	269.5	269.9	271.0	271.3
10.....	268.6	268.7	268.5	270.0	270.1	269.8	269.6	269.4	270.4	271.3	271.1
11.....	269.5	268.8	268.7	269.9	270.2	270.0	269.7	269.5	270.7	271.6	271.7
12.....	269.2	269.0	268.8	269.9	270.1	269.7	269.8	269.5	270.8	272.5	271.9
13.....	269.4	269.1	268.7	270.4	270.0	269.7	269.4	269.5	270.8	272.4	271.9
14.....	269.0	268.8	268.7	270.7	270.0	269.8	269.5	269.3	270.8	272.4	272.0
15.....	269.7	268.0	269.0	270.5	270.1	270.1	269.5	270.3	270.8	272.4	272.0
16.....	268.8	267.2	268.8	270.6	269.7	270.5	269.5	269.5	270.4	272.3	272.0
17.....	269.4	268.8	268.7	270.7	270.0	270.9	269.5	269.0	270.5	272.1	269.9
18.....	269.0	269.0	268.6	270.4	270.3	270.8	269.5	269.6	270.5	272.1	271.7
19.....	268.8	268.4	269.0	270.3	270.5	270.5	269.5	269.5	270.8	271.9	271.8
20.....	269.1	268.3	269.4	270.4	270.6	270.5	269.5	269.7	270.9	271.6	271.4
21.....	268.6	268.4	269.5	270.5	270.5	270.4	269.5	269.6	271.0	271.7	271.5
22.....	269.0	268.9	269.8	270.0	270.2	270.0	269.5	269.7	270.9	271.1	271.6
23.....	269.25	268.7	269.8	270.0	270.2	270.7	269.4	269.0	271.0	271.1	272.3
24.....	268.8	269.0	270.0	270.0	270.0	270.2	269.9	269.0	270.8	271.2	272.6
25.....	268.8	268.8	269.5	270.0	270.0	270.9	270.7	269.7	270.6	271.3	272.8
26.....	269.0	268.3	269.7	270.2	269.8	270.4	270.0	269.8	270.5	271.3	272.5
27.....	269.7	268.8	269.7	270.3	269.8	270.5	269.9	269.8	270.6	271.6	272.5
28.....	269.0	268.7	269.8	270.3	270.0	270.4	269.9	269.9	271.0	271.3	272.3
29.....	268.8	268.7	269.9	270.6	269.8	270.4	269.9	.....	270.8	271.4	272.2
30.....	269.0	268.5	269.9	270.0	269.8	270.2	269.7	.....	271.0	271.4	272.0
31.....	268.9	268.5	.....	270.5	.....	270.2	269.7	.....	270.8	.....	272.8

NOTE.—Station discontinued May 31, 1919.

OSWEGO RIVER, EAST SIDE, ABOVE CURVED DAM, OSWEGO

Gage No. 168

This gage was established December, 1907, as gage L of the Oswego specials. The gage was originally a reference point, elevation 275.56, located at the east end of the curved dam on the upstream face of the abutment about twenty-five feet from the end of the crest. On August 16, 1916, a standard Type A gage, No. 168, was erected at the south end of the upper east gate recess of lock No. 7. It has a range of 8 feet, between elevations 267.0 and 275.0. A standard bench-mark plug was set in the wall near the gage at elevation 275.0 (B. C. datum).

This gage should not be confused with the gage on the west side of the river, the record of which is published as "Oswego River above Curved Dam, Oswego."

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 95

The gage was read to tenths, with occasional readings to half-tenths, twice daily—at 6 A. M. and 6 P. M., July 1 to 6 and May 6 to June 30, and at 8 A. M. and 4 P. M., November 26 to May 5—and four times daily—at 6 A. M., noon, 6 P. M. and midnight, July 7 to November 25. Read by A. E. Cheney, Fred Decker, Jos. W. Carroll and J. A. Donovan.

Daily elevation of water-surface (B. C. datum) of OSWEGO RIVER, EAST SIDE, ABOVE CURVED DAM, OSWEGO, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	270.00	269.52	269.12	269.89	270.71	269.80	270.25	269.30	270.00	270.15	271.50	272.00
2.....	269.80	269.30	268.82	270.25	270.74	269.85	270.00	270.00	269.60	270.40	271.85	271.90
3.....	269.60	269.35	269.12	270.34	270.88	269.85	270.15	269.95	270.35	270.40	271.85	271.70
4.....	269.40	269.10	269.20	270.18	271.18	269.70	270.10	269.75	270.30	271.05	271.70	271.20
5.....	269.75	269.32	269.08	270.22	270.75	269.50	270.05	269.65	270.30	271.25	271.35	270.20
6.....	269.60	269.35	267.48	270.18	270.62	269.68	270.20	269.70	270.20	271.40	271.40	270.10
7.....	269.55	269.30	269.05	270.45	270.78	269.60	270.05	269.70	270.00	271.30	271.30	270.65
8.....	269.62	269.22	269.30	269.98	270.40	269.82	269.90	269.70	269.85	271.30	271.30	270.75
9.....	269.12	269.30	268.90	270.29	270.40	269.85	269.90	269.25	269.85	271.20	271.15	270.60
10.....	269.02	269.28	269.12	270.38	270.55	269.50	269.70	269.75	270.45	271.30	271.10	270.45
11.....	269.25	268.88	269.20	270.35	270.40	269.80	269.75	269.65	270.80	271.55	271.95	270.20
12.....	269.42	269.40	269.20	270.31	270.15	269.75	269.60	269.45	270.90	272.15	272.10	270.30
13.....	269.58	269.28	269.12	270.80	270.04	269.65	269.90	269.35	270.75	272.60	272.00	270.95
14.....	269.52	269.28	269.18	270.72	270.08	269.80	269.80	269.40	270.60	272.60	272.15	270.50
15.....	269.92	269.35	269.25	270.60	269.72	269.98	269.80	270.10	270.60	272.45	272.15	270.80
16.....	269.58	269.22	269.08	270.50	269.98	270.45	269.75	269.70	270.20	272.20	271.80	270.35
17.....	269.45	268.85	269.32	270.32	270.34	270.20	269.60	269.80	270.60	272.10	271.45	270.45
18.....	269.38	269.05	269.50	270.12	270.60	270.65	269.70	269.75	270.60	272.00	271.65	270.35
19.....	269.35	269.05	269.45	270.12	270.72	270.30	269.70	269.55	270.90	271.85	271.75	270.40
20.....	269.20	269.18	269.70	270.15	270.65	270.45	269.90	269.50	271.10	271.65	271.55	270.00
21.....	269.22	269.20	269.78	270.15	270.52	270.45	269.85	269.40	271.10	271.35	271.75	269.80
22.....	269.75	269.05	270.15	270.08	270.40	270.40	269.65	269.60	271.10	271.20	271.65	269.85
23.....	269.75	269.12	270.02	270.15	270.32	270.38	269.70	269.05	271.10	271.20	272.25	269.80
24.....	269.15	269.22	269.85	270.01	270.64	270.45	269.60	269.60	270.40	271.35	272.70	269.70
25.....	269.42	269.02	269.81	270.00	270.32	270.40	270.05	269.85	270.70	271.15	272.70	269.55
26.....	269.45	269.02	270.18	270.18	269.80	270.52	270.20	269.75	270.65	271.10	272.65	269.55
27.....	269.62	268.50	269.75	270.58	269.70	270.62	269.90	269.90	270.70	271.50	272.55	269.50
28.....	269.30	268.05	270.05	270.62	269.85	270.55	270.10	269.80	270.50	271.55	272.40	269.65
29.....	269.38	268.95	270.35	270.45	269.90	270.40	270.00	.....	270.60	271.40	272.25	269.70
30.....	269.55	268.58	270.30	270.20	269.90	270.15	270.00	.....	270.30	271.70	272.10	269.85
31.....	269.55	268.72	.....	270.45	.....	270.25	269.90	.....	267.65	.....	272.10	.....

OSWEGO RIVER, BELOW LOCK No. 8, OSWEGO

Gage No. 166

This gaging station is located at the mouth of the Oswego river in the harbor at Oswego and indicates very closely the lake level, except during times of large flow in the Oswego river, when there will be some slight slope below the gage. It was established December, 1907, and was located on the east side of the river below Bridge street bridge, the bridge nearest the lake. The lower gage

in new lock No. 8 was used until August 11, 1916. On August 11, 1916, a standard Type A gage, No. 166, was erected on the end of lower east approach wall to lock No. 8. It has a range of 4 feet, between elevations 247.0 and 251.0. A standard benchmark plug was set in the wall near the gage at elevation 249.05 (B. C. datum).

This gage was read to half-tenths four times daily, July 1 to December 7, and twice daily, December 8 to June 30. Read by Peter Langan, Frank Pearson and Herbert Penfield.

Daily elevation of water-surface (B. C. datum) of Oswego River below Lock No. 8, Oswego, for the year ended June 30, 1910

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	248.01	247.80	247.40	247.18	247.14	247.02	247.20	247.20	247.00	247.55	248.00	249.10
2.....	248.01	247.76	247.20	247.11	247.22	246.92	247.00	247.05	246.85	247.50	248.25	249.20
3.....	248.00	247.66	247.28	247.20	247.02	246.95	247.00	247.00	246.98	247.45	248.10	249.15
4.....	248.04	247.62	247.26	247.24	247.12	247.04	247.05	247.10	246.80	247.45	248.05	249.10
5.....	248.05	247.62	247.35	247.22	247.12	247.01	247.00	247.00	247.10	247.45	248.00	249.00
6.....	247.96	247.52	247.35	247.22	247.80	246.92	247.00	247.05	247.05	247.50	248.30	249.00
7.....	248.04	247.70	247.32	247.16	247.02	246.90	246.95	247.05	246.95	247.50	248.30	249.05
8.....	247.99	247.68	247.44	247.05	247.00	247.00	247.00	247.05	246.85	247.50	248.40	249.00
9.....	247.58	247.55	247.11	247.08	247.00	246.95	247.15	246.95	246.72	247.55	248.35	249.10
10.....	247.50	247.56	247.25	247.05	247.08	246.85	247.30	246.90	247.10	247.45	248.30	249.10
11.....	247.55	247.46	247.25	247.10	247.00	246.82	247.28	246.90	247.15	247.50	248.45	249.10
12.....	248.01	247.65	247.12	247.10	247.02	246.88	247.05	247.00	247.15	247.85	248.50	249.10
13.....	248.00	247.61	247.20	247.14	247.00	246.85	247.20	247.00	247.15	247.90	248.60	249.10
14.....	247.99	247.62	247.18	247.21	247.09	246.90	247.10	247.00	247.00	247.90	248.60	249.10
15.....	247.98	247.48	247.16	247.20	247.00	246.85	247.05	247.00	246.82	247.85	248.60	249.10
16.....	247.96	247.61	247.16	247.20	246.98	247.00	247.00	247.00	246.85	247.65	248.60	249.05
17.....	247.98	247.68	247.32	247.11	246.95	247.00	247.10	247.00	246.92	247.90	248.60	249.10
18.....	247.80	247.60	247.32	247.11	246.95	246.95	247.00	247.10	247.30	248.10	248.70	249.05
19.....	247.86	247.51	247.16	246.95	247.11	246.95	247.30	247.05	247.30	248.00	248.70	249.00
20.....	247.83	247.48	247.16	247.10	247.19	247.00	246.95	247.10	247.35	248.00	248.55	249.05
21.....	247.88	247.36	247.28	247.16	247.19	246.90	247.00	246.95	247.35	248.05	248.80	249.05
22.....	247.81	247.44	247.36	247.02	247.20	246.85	247.00	246.80	247.42	248.00	248.95	249.05
23.....	247.86	247.38	247.20	247.02	247.21	247.00	246.95	246.95	247.38	248.00	249.05	249.00
24.....	247.78	247.40	247.25	246.98	247.15	246.90	247.40	247.05	247.45	248.15	249.05	248.95
25.....	247.80	247.41	247.26	246.98	247.22	247.00	247.20	246.70	247.45	248.10	249.10	248.90
26.....	247.88	247.40	247.29	247.00	247.09	247.25	246.95	247.18	247.28	248.15	249.15	248.95
27.....	247.81	247.34	247.35	247.00	247.02	247.20	247.20	246.85	247.60	248.00	249.30	249.05
28.....	247.74	247.22	247.15	247.00	246.98	247.20	247.00	246.75	247.90	248.10	249.20	249.00
29.....	247.66	247.35	247.16	247.05	247.02	247.00	247.12	.....	247.85	248.20	249.20	248.95
30.....	247.72	247.40	247.16	247.00	247.02	247.20	247.00	.....	247.40	248.20	249.05	248.95
31.....	247.77	247.38	.....	247.12	.....	247.05	247.20	.....	247.50	.....	249.15	.....

SENECA RIVER BASIN

DESCRIPTION

Seneca river receives the drainage from the central group of lakes lying southward from Lake Ontario, known as the finger lakes. The drainage basin is rolling, though not precipitous, ex-

cepting for the deep narrow valleys crossing it, in which the lakes are situated, and certain additional valleys not at the present time occupied by lakes. All of the lakes properly belonging to the finger lake system do not drain into the Seneca river. Oneida lake on the east is tributary to Oneida river, while on the west of the Seneca river there is a series of lakes, including Honeoye, Canadice, Hemlock and Conesus lakes, smaller than, but parallel with and otherwise similar to the main finger lakes, which are tributary to Genesee river. The upper lakes of the system in the Seneca river basin are Onondaga, Otisco, Skaneateles, Owasco, Cayuga, Seneca, Keuka and Canandaigua lakes.

For table of drainage areas see page 74.

SENECA RIVER

DESCRIPTION

The stream designated as Seneca river originates at the outlet of Seneca lake, flows easterly into the foot of Cayuga lake and then northerly through the extensive Montezuma marshes to a point near Savannah, where it leaves the broad marsh area and turns easterly, passing to the north of Syracuse and receiving Onondaga outlet, then turning northerly and joining Oneida river at Three River Point to form the Oswego river. This river has been canalized for the Barge canal throughout its entire length. The construction of five dams and the necessary dredging has resulted in a series of navigable pools having low navigable water-surfaces referred to Barge canal datum as follows:

Above Three River Point due to the dam at Phoenix on the Oswego river, Elev. 363.0; above Baldwinsville, Elev. 374.0; above foot of Cayuga lake, Elev. 381.5; above Seneca Falls, Elev. 430.5; above Waterloo, Elev. 445.0.

The most important tributaries of Seneca river are the outlets of Onondaga, Otisco, Skaneateles and Owasco lakes, and Clyde river, which enters the Seneca river near Clyde and which in turn is formed by the junction of Ganargua creek, often called Mud creek, and Canandaigua outlet at Lyons.

The following tables show the daily elevation of water-surface at different gages maintained on Seneca river during the year

ended June 30, 1919, exclusive of those on Seneca and Cayuga lakes, which are given separately.

SENECA RIVER ABOVE LOCK No. 4, WATERLOO

Gage No. 251

This station is located above the new Barge canal lock No. 4, in the village of Waterloo. The new dam, or regulating works, consisting of six Taintor gates, each having a clear span of 36 feet, three with sills at elevation 439.0 and three at elevation 435.0, is located immediately below and replaces the old fixed dam. The three larger openings can pass water only to the power-plant of the Tracy Development Company. The low navigable surface above this dam is elevation 445.0.

The concrete staff gage in the upper end of the lock was read twice daily—at 8 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER ABOVE LOCK No. 4, WATERLOO, for the year ended June 30, 1919. B. R. McNair and Geo. F. Stone, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	446.3	445.35	444.9	444.4	444.2	444.2	444.1	443.7	443.1	443.8	445.0	447.2
2.....	446.1	445.7	444.9	444.45	444.25	444.05	443.95	443.6	443.2	443.75	445.0	447.15
3.....	446.25	445.5	444.55	444.5	444.3	444.1	443.95	443.4	443.05	443.9	445.2	447.15
4.....	446.45	445.75	444.4	444.4	444.25	443.9	444.0	443.45	443.1	443.9	445.1	447.05
5.....	446.3	445.25	444.1	444.5	444.2	443.9	444.15	443.6	443.0	443.95	445.25	447.1
6.....	446.35	445.2	444.15	444.55	444.2	444.0	443.95	443.4	443.1	444.1	445.1	447.1
7.....	446.3	445.35	444.3	444.5	444.2	443.95	443.95	443.5	443.0	443.9	445.25	447.25
8.....	446.15	445.4	444.55	444.4	444.3	444.1	443.9	443.5	443.2	444.0	445.05	447.15
9.....	445.85	445.4	444.3	444.55	444.1	443.8	443.85	443.5	443.15	444.0	445.4	447.2
10.....	445.95	445.45	444.0	444.5	444.25	443.75	443.95	443.25	443.25	444.1	446.35	447.1
11.....	445.9	445.6	444.15	444.4	444.25	443.95	443.9	443.35	443.3	444.45	445.75	447.0
12.....	446.05	445.45	444.2	444.45	444.05	443.85	443.9	443.45	443.35	444.5	445.75	446.95
13.....	446.0	445.35	444.05	444.5	444.1	443.95	443.75	443.3	443.35	444.6	445.9	446.9
14.....	446.2	445.1	444.35	444.35	444.0	444.05	443.75	443.2	443.4	444.75	446.1	446.95
15.....	445.95	445.3	444.45	444.35	444.05	444.1	443.85	443.3	443.5	444.7	446.1	446.85
16.....	445.95	445.1	444.15	444.3	444.05	443.95	443.75	443.4	443.6	444.8	446.1	446.9
17.....	446.0	445.4	444.15	444.3	444.2	443.95	443.8	443.3	443.5	444.75	446.2	446.95
18.....	445.75	445.45	444.3	444.2	444.35	443.9	443.9	443.3	443.55	444.85	446.35	446.75
19.....	445.7	445.15	444.25	444.25	444.3	443.9	443.9	443.2	443.55	444.65	446.0	446.9
20.....	445.9	445.0	444.15	444.4	444.35	443.9	443.7	443.25	443.6	445.0	446.05	446.65
21.....	445.95	444.8	444.5	444.05	444.35	443.95	443.5	443.2	443.55	444.85	446.0	446.75
22.....	445.65	444.8	444.55	444.15	444.3	444.1	443.65	443.25	443.65	444.8	446.2	446.8
23.....	445.75	444.7	444.3	444.05	444.2	443.85	443.8	443.3	443.7	444.85	446.55	446.75
24.....	445.65	445.0	444.45	443.95	444.35	443.9	443.8	443.3	443.7	444.95	446.9	446.6
25.....	445.85	445.05	444.25	444.1	444.3	a	443.8	443.1	443.6	445.0	447.15	446.75
26.....	445.7	444.75	444.35	444.1	444.35	444.0	443.85	443.25	443.6	445.0	446.95	446.8
27.....	445.8	444.7	444.3	444.35	444.1	443.95	443.65	443.15	443.55	444.95	447.0	446.6
28.....	445.85	444.65	444.45	444.3	444.35	443.9	443.65	443.05	443.65	444.95	447.15	446.65
29.....	445.7	444.65	444.45	444.2	444.2	444.15	443.6	.....	443.7	444.8	447.0	446.85
30.....	445.75	444.6	444.35	444.0	444.15	443.8	443.65	.....	443.75	444.7	447.2	446.65
31.....	446.1	444.75	.....	444.3	.....	443.9	443.6	.....	443.7	.....	447.3	.....

a No record.

SENECA RIVER BELOW LOCK No. 4, WATERLOO

Gage No. 252

This station is located just below the new Barge canal lock No. 4, in the village of Waterloo.

The concrete staff gage in the lower end of the lock is read. The water-surface indicated is that of the Seneca river about 2,000 feet above the gage formerly read below old lock No. 2 at the junction of the old canal and the river.

The gage was read twice daily—at 8 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER BELOW LOCK No. 4, WATERLOO, for the year ended June 30, 1919. B. R. McNair and Geo. F. Stone, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	431.05	431.55	429.8	429.4	430.0	429.45	429.5	429.8	429.95	429.85	429.75	430.25
2	430.95	431.25	429.95	429.55	430.1	429.8	429.7	430.75	430.45	429.6	430.0	430.45
3	431.05	431.4	429.9	429.6	430.0	429.85	429.55	429.8	430.15	429.8	429.8	430.8
4	431.0	430.7	429.85	429.55	430.05	429.6	429.8	429.6	429.9	429.65	429.6	430.35
5	431.2	431.1	430.0	429.6	429.85	429.6	429.65	429.75	429.7	430.0	429.7	430.1
6	431.2	431.2	429.85	430.6	429.8	429.8	429.65	429.7	430.0	429.5	429.9	430.8
7	430.85	431.15	429.85	430.95	429.55	429.5	429.75	429.65	429.9	429.6	430.3	430.7
8	431.15	431.1	429.8	430.8	429.6	429.95	429.65	429.75	430.1	429.65	429.45	431.25
9	430.9	430.95	429.85	430.9	429.45	429.75	429.95	429.6	429.9	430.1	429.95	430.8
10	431.2	431.0	430.0	431.0	429.7	429.85	429.65	429.7	430.2	430.35	430.25	430.6
11	431.35	431.3	429.85	430.95	429.7	429.65	430.1	429.75	430.0	431.1	431.0	431.1
12	431.4	430.9	429.85	430.75	429.75	429.7	430.05	429.8	430.1	429.85	430.4	431.2
13	430.95	431.05	429.75	430.4	429.95	429.8	429.8	429.65	430.0	430.05	429.9	431.45
14	431.15	431.0	429.9	430.5	430.0	429.95	429.65	429.65	430.05	430.05	430.0	431.1
15	430.75	431.05	429.75	430.45	429.75	430.25	429.6	429.4	430.05	429.75	430.05	431.05
16	431.0	430.45	430.0	430.65	430.1	429.6	429.6	424.0	429.5	430.0	429.6	430.85
17	430.6	428.05	430.5	430.2	429.7	429.9	429.7	429.6	430.4	430.25	430.1	429.75
18	431.1	426.05	429.7	429.95	430.35	429.5	429.85	429.85	430.0	430.25	429.7	431.25
19	430.9	423.9	430.2	429.5	429.85	429.85	430.3	429.7	429.95	430.0	429.7	430.8
20	431.0	429.15	430.85	429.7	429.9	430.0	429.75	429.8	429.75	429.6	429.8	431.9
21	430.95	429.65	430.85	430.1	429.75	429.65	429.7	429.75	429.75	429.65	429.95	430.85
22	430.95	429.9	430.55	429.75	430.1	429.75	429.75	429.7	429.6	429.75	430.65	430.6
23	431.15	429.8	430.55	429.5	429.95	429.9	429.6	429.7	429.9	430.0	430.8	430.9
24	431.3	429.2	430.55	430.2	429.95	429.8	429.75	429.65	430.0	430.55	430.55	430.2
25	430.65	429.45	430.2	429.75	430.0	a	429.75	429.85	430.0	430.35	429.35	430.9
26	431.15	429.85	430.05	430.2	429.9	429.95	429.8	429.8	429.95	430.35	430.65	430.75
27	431.05	430.05	429.95	430.05	429.95	430.1	429.55	429.85	429.75	430.8	430.0	431.0
28	431.1	429.65	430.25	430.8	429.65	429.85	429.8	429.75	429.75	430.5	430.3	430.35
29	431.45	429.75	430.05	431.25	429.95	429.9	429.6	.....	429.65	430.05	430.1	430.45
30	431.15	429.8	429.7	430.05	429.6	429.55	429.55	.....	429.35	429.55	430.2	431.15
31	431.25	429.7	.....	429.85	.....	429.95	429.6	.....	429.75	.....	430.6	.....

a No reading.

SENECA RIVER ABOVE LOCK No. 3, SENECA FALLS

Gage No. 253

This station, established June 17, 1917, is located above the lock dam at Seneca Falls. This dam was built to maintain a low water-surface at elevation 430.5.

The concrete staff gage at the upper end of lock No. 3 is read twice daily—at 9 A. M. and 4 P. M.—to tenths. Read by J. D. Compson, C. H. Condon, E. F. Palmatier and M. L. Toombs.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER ABOVE LOCK No. 3, SENECA FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	430.7	431.1	429.7	429.55	429.65	429.5	429.5	429.75	429.7	429.85	429.45	430.55
2	430.7	430.9	429.65	429.55	429.9	429.7	429.55	430.5	430.8	429.65	429.85	430.55
3	430.65	431.2	429.45	429.6	430.15	429.9	429.6	429.7	429.95	429.85	429.65	430.2
4	431.05	430.65	429.65	429.85	429.9	429.55	429.8	429.6	429.9	429.8	429.55	430.4
5	430.95	430.9	429.7	429.8	429.8	429.7	429.8	429.6	429.5	430.05	429.75	430.0
6	431.15	430.95	429.4	430.65	429.8	429.6	429.5	429.65	429.85	429.55	430.0	430.55
7	430.7	430.85	430.0	430.85	429.6	429.45	429.7	429.55	430.1	429.65	430.1	430.8
8	431.0	430.8	429.8	430.9	429.4	429.9	429.55	429.75	429.9	429.7	430.05	431.0
9	430.7	430.8	429.5	431.2	429.6	429.6	429.95	429.5	429.95	430.0	429.8	430.6
10	430.95	430.85	429.65	431.0	429.75	429.8	429.55	429.65	430.1	430.3	430.1	430.55
11	431.25	431.15	429.55	431.05	429.8	429.6	430.0	429.5	430.0	431.1	431.15	431.0
12	430.95	430.75	429.4	430.8	429.8	429.6	430.1	429.7	430.0	429.75	429.95	431.1
13	430.8	430.8	429.15	430.5	429.85	429.5	429.7	429.5	430.05	429.7	429.75	431.35
14	431.25	430.7	429.6	430.45	429.75	429.9	429.6	429.65	429.85	429.9	429.85	431.1
15	430.55	430.85	429.8	430.6	429.7	430.2	429.6	429.5	429.95	429.55	429.9	431.0
16	430.8	430.05	429.85	430.65	430.05	429.65	429.7	423.8	429.35	430.05	429.25	430.75
17	430.7	428.0	430.5	430.3	429.7	429.75	429.75	429.55	430.45	430.4	430.0	429.4
18	430.35	425.95	429.55	429.95	430.35	429.5	429.9	429.9	429.8	430.3	429.75	431.1
19	430.6	423.4	430.1	429.65	429.8	429.7	430.4	429.5	429.85	429.95	429.4	430.8
20	430.8	428.8	430.35	430.25	429.85	429.8	429.8	429.95	429.75	429.7	429.5	430.5
21	430.9	429.3	430.75	430.8	429.7	429.55	429.85	429.65	429.85	429.6	429.85	430.75
22	430.8	429.6	430.7	431.3	429.95	429.65	429.6	429.8	429.5	429.9	430.65	430.3
23	431.05	429.4	430.4	430.05	430.0	429.8	429.65	429.65	429.8	429.8	430.85	430.9
24	430.95	428.95	430.55	429.7	430.0	429.6	429.7	429.75	429.95	430.35	430.15	430.3
25	430.55	429.55	430.1	429.75	429.75	429.75	429.8	429.8	429.9	430.0	429.5	430.75
26	430.95	429.45	429.8	430.05	429.8	429.65	429.85	429.8	429.9	430.35	430.75	430.7
27	430.7	429.75	429.7	429.85	429.7	429.8	429.65	429.65	429.8	430.7	429.4	430.9
28	431.35	429.3	430.2	429.95	429.85	429.75	429.75	429.65	429.8	430.15	430.25	430.35
29	431.15	429.55	429.95	429.7	429.95	429.95	429.6	.....	429.75	429.85	430.3	430.4
30	431.0	429.25	429.4	429.45	429.75	429.65	429.5	.....	429.35	429.3	430.15	431.1
31	430.85	429.45	.....	430.0	.....	429.65	429.55	.....	429.8	.....	430.55	.....

SENECA RIVER AT FREE BRIDGE

This station was established January 1, 1915, and is located at the highway bridge across the Seneca river on the highway leading east from Seneca Falls and about 5 miles distant therefrom, and about 1 mile north, or downstream from Barge canal lock No. 1 of the Cayuga and Seneca canal at the foot of Cayuga lake.

The gage is a direct-reading staff, read twice daily to tenths with occasional half-tenth readings.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER AT FREE BRIDGE,
NEAR CAYUGA, for the year ended June 30, 1919. C. D. Martin, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375.35	375.05	375.20	376.35	376.00	375.45	375.25	375.60	375.75	377.40	377.70	379.55
2.....	375.10	375.00	375.20	376.30	375.90	375.25	375.55	375.60	375.90	377.30	377.40	379.40
3.....	375.30	375.00	375.10	376.45	375.90	375.05	375.85	375.60	375.90	377.45	377.60	.....
4.....	375.60	374.90	375.10	376.35	375.80	374.85	375.70	375.50	375.75	377.60	377.55	.....
5.....	375.75	375.60	375.60	376.80	375.70	374.79	375.85	375.40	375.70	377.75	377.50	.....
6.....	375.95	375.00	375.10	376.55	375.60	375.05	376.00	375.40	375.68	377.80	377.40	.....
7.....	376.00	375.00	374.98	376.75	375.60	374.95	375.90	375.40	375.60	377.92	377.05	.....
8.....	375.15	375.00	375.05	376.25	375.70	375.05	375.80	375.40	375.58	378.00	376.85	.....
9.....	375.50	375.10	375.20	376.05	375.60	375.25	375.75	375.50	375.95	377.98	377.00	.....
10.....	375.75	375.10	375.42	375.90	375.60	375.35	375.87	375.40	376.60	378.00	377.45	.....
11.....	375.95	374.90	375.50	375.90	375.70	375.55	375.75	375.40	376.85	378.70	378.90	.....
12.....	376.00	375.00	375.50	375.90	375.62	375.65	375.80	375.40	376.70	380.65	379.65	.....
13.....	376.90	375.05	375.60	376.90	375.50	375.40	375.80	375.30	376.50	379.85	379.80	.....
14.....	375.80	375.25	375.50	376.00	375.50	375.55	375.85	376.32	376.15	379.65	379.20	.....
15.....	375.80	375.40	375.50	376.05	375.60	375.95	375.70	375.45	375.90	379.05	378.05	.....
16.....	375.70	375.00	375.40	375.85	375.75	376.10	375.70	375.60	376.05	377.70	377.75	.....
17.....	375.68	374.80	375.55	376.65	375.75	376.05	375.70	375.60	377.00	377.65	377.75	.....
18.....	375.60	374.90	375.60	375.55	376.45	375.75	375.70	375.50	377.65	377.40	377.95	.....
19.....	375.50	375.00	375.65	375.45	376.85	375.50	375.80	375.40	377.75	377.19	378.00	.....
20.....	375.50	374.88	375.85	375.35	376.40	375.60	375.82	375.40	377.55	376.90	377.65	.....
21.....	375.60	374.75	376.10	375.50	376.05	375.60	375.70	375.40	377.85	378.90	377.90	.....
22.....	375.48	374.58	376.00	375.50	375.65	375.65	375.70	375.50	377.20	376.75	378.70	.....
23.....	375.40	374.45	375.85	375.50	375.45	375.80	375.80	375.50	376.95	376.55	379.65	.....
24.....	375.40	374.55	376.55	375.45	375.30	375.65	375.80	375.60	376.75	376.75	380.25	.....
25.....	375.40	374.75	376.75	375.45	375.25	375.85	375.80	375.70	376.60	376.80	380.85	.....
26.....	375.30	374.80	376.65	375.65	375.15	376.05	375.90	375.70	376.60	377.00	380.55	.....
27.....	375.30	374.70	376.75	375.85	375.10	375.95	375.80	375.75	376.60	377.50	379.75	.....
28.....	375.20	374.60	376.50	375.75	375.00	375.75	375.72	375.60	376.65	377.80	379.30	.....
29.....	375.20	374.70	376.45	375.70	374.90	375.55	375.70	.....	376.90	377.95	379.30	.....
30.....	375.20	374.80	376.50	375.82	375.05	375.40	375.68	.....	377.20	377.88	379.35	.....
31.....	375.15	374.88	.....	375.90	.....	375.25	375.60	.....	377.35	.....	379.65	.....

NOTE.—Station discontinued June 3, 1919.

SENECA RIVER ABOVE LOCK No. 1, NEAR CAYUGA

Gage No. 401

A new standard gage, No. 401, was established June 1, 1919, on the face of the west lock wall above the upper gates of lock No. 1 (Mud lock) on the Cayuga and Seneca canal, about two miles north of the village of Cayuga. The gage is built in the concrete and graduated to tenths of a foot. The range is 17.2 feet, between elevations 369.5 and 386.7 (B. C. datum). Eleva-

tion of pool is 381.5. The gage bench-mark is located at the upper end, lower east guide wall of the lock, at elevation 381.0 (B. C. datum).

Daily elevation of water-surface (B. C. datum) of SENECA RIVER ABOVE LOCK No. 1, NEAR CAYUGA, for the year ended June 30, 1919. Albion Morton, Observer

DAY	June	DAY	June	DAY	June
1.....	384.75	11.....	384.55	21.....	384.25
2.....	384.6	12.....	384.50	22.....	384.20
3.....	384.6	13.....	384.55	23.....	384.30
4.....	384.65	14.....	384.45	24.....	384.25
5.....	384.75	15.....	384.45	25.....	384.35
6.....	384.65	16.....	384.35	26.....	384.45
7.....	384.65	17.....	384.35	27.....	384.2
8.....	384.75	18.....	384.30	28.....	384.1
9.....	384.85	19.....	384.40	29.....	384.2
10.....	384.55	20.....	384.45	30.....	384.2

SENECA RIVER BELOW LOCK No. 1, NEAR CAYUGA

Gage No. 402

A new standard gage, No. 402, was established June 1, 1919, on the face of the west lock wall and just north of the lower gates of lock No. 1 (Mud lock), Cayuga and Seneca canal, about two miles north of the village of Cayuga. The gage is built in the lock and has a range of 22.6 feet, between elevations 362.0 and 384.6. The gage bench-mark, located on the back side of the lower buffer-beam section, is at elevation 381.00 (B. C. datum).

This gage replaces "Free Bridge."

Daily elevation of water-surface (B. C. datum) of SENECA RIVER BELOW LOCK No. 1, NEAR CAYUGA, for the year ended June 30, 1919. Albion Morton, Observer

DAY	June	DAY	June	DAY	June
1.....	379.60	11.....	378.6	21.....	375.75
2.....	378.80	12.....	378.15	22.....	375.95
3.....	377.20	13.....	377.85	23.....	376.0
4.....	376.55	14.....	377.75	24.....	375.92
5.....	376.10	15.....	377.65	25.....	375.95
6.....	376.30	16.....	377.6	26.....	375.82
7.....	377.0	17.....	377.55	27.....	376.1
8.....	377.25	18.....	377.05	27.....	376.3
9.....	378.05	19.....	376.2	29.....	376.15
10.....	378.65	20.....	375.95	30.....	376.0

SENECA RIVER AT MONTEZUMA

Gage No. 203

The gage for this station is now located at the R. S. & E. R. R. bridge near Montezuma. It was originally established, as a standard chain gage, on May 4, 1904, at the N. Y. C. R. R. bridge,

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 103

at Fox Ridge, near Savannah. During the summer of 1916 it was moved about $2\frac{3}{4}$ miles south, or upstream, to the Toll Road bridge and a standard Type A gage, No. 203, was placed on the north side of the boat-house, just below the bridge; readings were obtained from October 1, 1916, to May 31, 1919, inclusive. Transferred to the south end, east pier, of the R. S. & E. R. R. bridge, the gage has a range of 16 feet and is in two sections. The lower section, between elevations 370.0 and 378.0, is on the south wall and the upper section, between elevations 378.0 and 386.0, is on the east wall. Records date from June 1, 1919. The gage bench-mark, a square cut on the southwest corner of the bridge seat, east abutment, is at elevation 393.50 (B. C. datum). The gage was read once daily to tenths.

Daily elevation of surface-water (B. C. datum) of SENECA RIVER AT MONTEZUMA, for the year ended June 30, 1919. William T. Tanner, Jr., and Harold Higgins, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375.4	375.0	a	376.7	375.5	a	a	375.1	375.2	a	377.6	379.2
2.....	375.2	374.9	374.5	376.2	375.7	375.2	375.3	a	a	a	377.2	378.7
3.....	375.7	374.9	374.5	376.3	a	375.0	375.7	375.2	375.5	376.8	377.4	377.0
4.....	376.0	a	374.5	376.2	375.7	374.6	375.6	375.1	375.3	377.0	a	376.4
5.....	375.4	374.9	374.6	376.2	375.6	374.5	a	375.0	375.4	377.3	377.3	376.0
6.....	375.6	374.9	374.8	a	375.6	374.5	375.6	375.0	375.2	a	377.1	376.1
7.....	a	374.8	374.9	376.3	375.5	374.5	375.6	375.0	375.2	377.3	377.0	376.7
8.....	375.5	374.9	a	376.1	375.4	a	375.5	375.0	375.1	377.5	376.7	377.0
9.....	375.2	375.0	375.2	376.1	375.5	375.0	375.4	a	a	377.6	376.8	377.5
10.....	375.5	374.9	375.3	376.1	a	375.0	375.4	375.1	376.1	377.5	376.9	378.3
11.....	376.0	a	375.3	375.9	375.8	375.1	375.3	375.0	376.5	378.0	a	378.3
12.....	375.9	375.1	375.3	375.9	375.9	375.1	a	a	376.3	379.6	a	378.0
13.....	375.9	375.1	375.4	a	376.0	375.2	375.5	374.9	376.1	a	a	377.5
14.....	a	374.8	375.4	375.8	375.9	375.4	375.4	375.0	375.8	379.0	379.1	377.5
15.....	375.7	374.8	a	375.7	375.6	a	375.3	375.0	375.5	378.4	378.1	377.4
16.....	375.7	374.7	375.5	375.7	375.8	375.9	375.3	a	a	377.9	377.8	377.4
17.....	375.7	374.7	375.7	375.6	a	375.9	375.2	375.1	376.5	377.6	377.5	377.3
18.....	375.6	a	375.7	375.4	376.1	375.4	375.3	375.1	a	377.3	a	377.1
19.....	375.5	374.8	375.7	375.4	376.7	375.4	a	375.0	377.3	377.0	a	376.0
20.....	375.3	374.8	375.8	a	376.1	375.4	375.4	375.0	377.1	a	a	375.8
21.....	a	374.6	375.8	375.4	376.0	375.4	375.3	375.0	376.9	376.8	a	375.8
22.....	375.9	374.5	a	375.4	376.0	a	375.3	a	376.7	376.7	378.4	375.8
23.....	375.5	374.4	376.0	375.4	375.8	375.7	375.3	a	a	376.5	379.3	375.8
24.....	375.4	374.3	376.4	375.3	a	375.5	375.4	375.2	376.4	376.5	379.8	375.7
25.....	375.3	a	376.3	375.3	375.5	a	a	375.2	376.2	376.7	a	375.7
26.....	375.4	374.4	376.4	375.4	375.0	a	a	375.2	376.2	a	380.3	375.7
27.....	375.3	374.4	376.5	a	375.0	375.8	375.4	375.1	376.1	a	379.8	375.8
28.....	a	374.5	376.5	375.4	374.7	375.7	375.3	375.1	376.2	377.7	379.0	376.0
29.....	375.3	374.4	a	375.5	374.7	a	375.3	.....	376.4	377.8	a	375.9
30.....	375.3	374.6	a	375.7	374.7	375.3	375.3	.....	a	377.8	a	375.9
31.....	375.2	374.7	.....	375.6	.....	375.1	375.2	.....	a	.....	a	.....

a No record.

NOTE.—Gage read at Toll Road bridge, July 1 to May 31; gage read at R & S. E. R. R. bridge, June 1 to 30.

SENECA RIVER AT MOSQUITO POINT

Gage No. 202

This station, established April 21, 1904, is located on the Seneca river at Mosquito Point highway bridge about 3 miles north of Port Byron village and just below the confluence of Owasco outlet and the Seneca river. The standard chain gage, located on the upstream side of the span adjacent to the left bank of Seneca river, was superseded on October 10, 1916, by a standard Type A gage. This gage, No. 202, is secured to the east end of the south abutment of Mosquito Point bridge and has a range of 16 feet, between elevations 371.0 and 387.0. The gage benchmark is a brass pin in concrete, east end of east wing wall, south abutment of bridge over canal, and is at elevation 387.304 (B. C. datum). The gage is read once daily — at 9 A. M. — to tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER AT MOSQUITO POINT BRIDGE, PORT BYRON, for the year ended June 30, 1919. William Prettie, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375.3	375.0	374.8	375.9	375.7	375.0	375.0	375.0	375.0	376.5	377.3	378.7
2.....	375.0	374.9	375.0	375.9	375.6	375.3	375.2	375.0	375.3	376.5	377.0	378.5
3.....	375.4	374.8	374.9	375.9	375.6	374.9	375.6	375.0	375.4	376.5	377.1	377.0
4.....	375.6	374.8	374.8	375.9	375.6	374.6	375.6	374.9	375.2	376.8	377.2	376.3
5.....	375.8	374.8	374.8	375.8	375.6	374.4	375.5	374.9	375.3	377.0	377.2	375.9
6.....	375.8	374.8	374.8	376.0	375.5	374.5	375.5	374.9	375.1	377.0	377.0	375.6
7.....	375.8	374.8	374.8	376.2	375.5	374.7	375.4	374.8	375.1	377.1	376.8	376.3
8.....	375.4	374.7	374.7	376.0	375.5	374.7	375.3	374.8	375.0	377.2	376.6	376.6
9.....	375.0	374.7	375.0	375.8	375.4	374.9	375.3	374.8	375.3	377.3	376.5	377.0
10.....	375.3	374.8	374.9	375.7	375.4	375.0	375.2	374.9	375.9	377.3	376.6	377.6
11.....	375.7	374.9	375.0	375.6	375.4	374.8	375.2	374.9	376.3	377.5	377.7	377.8
12.....	375.8	374.9	375.2	375.6	375.4	374.9	375.3	374.8	376.2	378.9	378.7	377.6
13.....	375.8	374.9	375.3	375.5	375.3	375.0	375.3	374.8	375.9	379.4	379.0	377.8
14.....	375.7	374.8	375.1	375.7	375.3	375.3	375.2	374.9	375.6	378.8	378.8	377.1
15.....	375.6	374.7	375.2	375.6	375.3	375.6	375.2	374.9	375.3	378.1	378.0	377.0
16.....	375.6	374.6	375.2	375.5	375.3	375.8	375.2	375.0	375.5	377.7	377.5	377.0
17.....	375.5	374.6	375.3	375.3	375.4	375.7	375.2	375.0	376.1	377.4	377.2	377.1
18.....	375.5	374.6	375.3	375.2	375.9	375.5	375.1	375.0	376.7	377.1	377.5	376.8
19.....	375.3	374.7	375.4	375.2	376.4	375.3	375.2	374.9	377.0	376.8	377.5	376.1
20.....	375.3	374.7	375.4	375.2	375.9	375.3	375.2	374.8	376.9	376.6	377.3	375.7
21.....	375.4	374.6	375.7	375.3	375.7	375.3	375.2	374.8	376.7	376.6	377.3	375.5
22.....	375.6	374.4	375.7	375.3	375.5	375.2	375.2	374.9	375.5	376.5	377.7	375.6
23.....	375.4	374.3	375.6	375.2	375.4	375.5	375.1	375.0	375.3	376.3	378.7	375.7
24.....	375.3	374.3	375.4	375.2	375.3	375.3	375.1	375.1	376.1	376.3	379.2	375.6
25.....	375.4	374.4	375.4	375.1	375.3	375.6	375.3	375.1	376.0	376.5	379.7	375.6
26.....	375.3	374.6	376.0	375.3	375.1	375.8	375.3	375.1	376.0	376.5	379.7	375.5
27.....	375.2	374.0	376.1	375.6	375.0	375.7	375.3	375.1	375.9	376.9	379.4	375.5
28.....	375.2	374.5	376.1	375.7	374.9	375.5	375.2	375.1	376.0	377.3	378.7	375.8
29.....	375.3	374.5	376.1	375.5	374.8	375.5	375.2	.....	376.1	377.5	378.4	375.8
30.....	375.2	374.5	376.1	375.5	374.8	375.2	375.2	.....	376.4	377.5	378.5	375.7
31.....	375.0	374.5	.....	375.6	.....	375.0	375.1	.....	376.5	.....	378.7	.....

SENECA RIVER AT CROSS LAKE

Gage No. 201

This station, established May 1, 1904, is located at the highway bridge across the Seneca river about 1 mile above the entrance

of the Seneca river into Cross lake and about 3 miles northwest of the village of Jordan. The gage, a staff, on a boat-house on the east, or right bank of the river just above the bridge, was superseded on November 13, 1916, by a standard chain gage, No. 201, placed on top of east railing of south span of Jordan highway bridge, above Cross lake, having a range of 12 feet, between elevations 371.0 and 383.0. The gage bench-mark is the northwest corner of concrete well slab in front of hotel on east side of river and is at elevation 393.62 (B. C. datum).

The gage is read twice daily — at 7 A. M. and 2 P. M. — to tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER AT CROSS LAKE, JORDAN, for the year ended June 30, 1919. M. Quimby, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375.2	374.65	374.8	375.7	375.6	375.05	374.9	374.9	375.05	376.3	376.85	377.95
2.....	374.95	374.7	375.0	375.65	375.5	375.15	375.15	374.9	375.2	376.3	376.7	377.75
3.....	375.25	374.7	375.0	375.65	375.5	374.85	375.4	374.9	375.2	376.25	376.8	376.85
4.....	375.45	374.6	374.8	375.6	375.5	374.6	375.5	374.95	375.1	376.45	376.8	376.05
5.....	375.65	374.65	374.8	375.65	375.5	374.6	375.45	374.9	375.1	376.7	376.7	375.65
6.....	375.6	374.7	374.7	375.85	375.35	374.6	375.2	374.8	375.0	376.75	376.6	375.55
7.....	375.6	374.7	374.7	376.1	375.3	374.7	375.2	374.9	374.9	376.8	376.5	375.9
8.....	375.25	374.7	374.8	375.8	375.4	374.7	375.2	374.9	375.0	376.8	376.25	376.3
9.....	375.0	374.75	374.9	375.7	375.4	374.9	375.1	374.9	375.2	376.9	376.2	376.65
10.....	375.15	374.7	375.0	375.6	375.4	374.9	375.1	374.9	375.85	376.95	376.35	377.05
11.....	375.45	374.8	374.95	375.4	375.3	374.9	375.0	374.8	376.1	377.25	377.3	377.2
12.....	375.6	374.8	375.0	375.4	375.3	374.85	375.0	374.7	375.95	378.25	378.1	377.05
13.....	375.6	374.7	375.1	375.5	375.2	375.1	375.1	374.7	375.75	378.65	378.3	376.85
14.....	375.55	374.7	375.1	375.5	375.2	375.2	375.1	374.8	375.45	378.2	378.15	376.7
15.....	375.35	374.55	375.1	375.4	375.1	375.45	375.0	374.9	375.2	377.6	377.6	376.7
16.....	375.3	374.4	375.1	375.3	375.2	375.7	375.0	375.0	375.25	377.15	377.1	376.6
17.....	375.3	374.5	375.2	375.3	375.3	375.75	375.0	375.0	375.8	377.0	376.9	376.7
18.....	375.3	374.55	375.2	375.2	375.8	375.4	375.1	374.9	376.35	376.75	377.1	376.45
19.....	375.2	374.7	375.2	375.2	376.1	375.2	375.1	374.8	376.6	376.55	377.15	375.85
20.....	375.2	374.6	375.4	375.2	375.85	375.2	375.15	374.8	376.55	376.4	376.85	375.55
21.....	375.2	374.45	375.6	375.25	375.6	375.2	375.1	374.8	376.4	376.35	376.85	375.4
22.....	375.35	374.2	375.6	375.1	375.5	375.25	375.1	374.85	376.25	376.25	377.35	375.45
23.....	375.2	374.2	375.4	375.1	375.3	375.4	375.1	375.05	376.1	376.15	378.15	375.5
24.....	375.1	374.2	375.3	375.15	375.2	375.3	375.2	375.1	375.95	376.1	378.45	375.4
25.....	375.0	374.4	375.2	375.05	375.2	375.55	375.2	375.0	375.85	376.15	378.85	375.35
26.....	375.05	374.5	375.65	375.25	375.1	375.6	375.2	375.0	375.8	376.35	378.85	375.4
27.....	375.0	374.5	375.95	375.4	374.9	375.5	375.2	375.0	375.7	376.65	378.6	375.45
28.....	375.1	374.4	375.9	375.55	374.8	375.4	375.1	375.0	375.75	376.95	378.05	375.6
29.....	375.1	374.5	375.9	375.4	374.9	375.35	375.1	.....	375.85	377.05	377.7	375.6
30.....	374.95	374.4	375.8	375.3	374.75	375.2	375.1	.....	376.1	377.05	377.8	375.5
31.....	374.8	374.55	.....	375.45	.....	375.05	375.05	.....	376.2	.....	377.85	.....

SENECA RIVER AT JACK'S REEF

Gage No. 200

This station, established April 20, 1904, is located on the Seneca river about 2 miles downstream from Cross lake and about 1,700 feet below what is commonly known as State Ditch bridge

across the canal cut-off on the road leading from the village of Jack's Reef, near Memphis. The gage, a vertical staff fastened to a tree on the left bank of the stream, was superseded on November 13, 1916, by a standard chain gage, No. 200, placed at the center of the State Ditch bridge on top of north railing, and has a range of 12 feet, between elevations 371.0 and 383.0. The gage bench-mark is top of plug in concrete monument 150 feet west of gage at elevation 394.65 (B. C. datum).

The gage is read once daily — at 9 A. M. — to tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER AT FOOT OF JACK'S REEF, MEMPHIS, for the year ended June 30, 1919. Wm. H. Burns, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375.2	374.8	374.5	375.6	375.5	374.8	374.7	374.8	374.8	376.1	376.6	377.2
2.....	375.0	374.7	374.8	375.5	375.6	374.9	374.9	374.9	375.2	376.1	376.4	377.3
3.....	375.1	374.6	374.7	375.5	375.6	374.8	375.3	374.9	375.1	376.0	376.5	377.4
4.....	375.3	374.7	374.6	375.5	375.4	374.6	375.2	374.8	375.0	376.1	376.6	375.9
5.....	375.6	374.8	374.5	375.5	375.3	374.4	375.2	374.8	375.0	376.3	376.5	375.6
6.....	375.8	374.6	374.6	375.6	375.2	374.3	375.1	374.7	374.9	376.4	376.5	375.3
7.....	375.6	374.6	374.5	375.8	375.2	374.3	375.0	374.7	374.8	376.5	376.4	375.7
8.....	375.3	374.6	374.6	375.7	375.3	374.4	374.9	374.6	374.7	376.5	376.2	376.0
9.....	374.9	374.6	374.8	375.5	375.3	374.7	374.8	374.7	375.1	376.6	376.0	376.3
10.....	375.1	374.5	374.8	375.4	375.2	374.7	374.7	374.8	375.6	376.8	376.1	376.7
11.....	375.4	374.6	374.9	375.3	375.2	374.7	374.7	374.8	375.9	376.8	376.8	376.9
12.....	375.5	374.8	374.9	375.2	375.1	374.6	374.8	374.7	375.7	377.6	377.5	376.8
13.....	375.5	374.7	374.9	375.3	375.1	374.8	374.9	374.7	375.4	378.0	377.8	376.6
14.....	375.4	374.6	375.0	375.4	375.2	374.9	374.9	374.6	375.3	377.8	377.7	376.4
15.....	375.4	374.5	375.0	375.3	375.1	375.3	374.8	374.7	375.2	377.3	377.2	376.4
16.....	375.3	374.4	375.0	375.2	375.1	375.4	374.8	374.9	375.1	376.9	376.8	376.4
17.....	375.3	374.4	375.0	375.1	375.2	375.4	374.7	374.9	375.5	376.6	376.5	376.3
18.....	375.2	374.4	375.0	375.0	375.7	375.2	374.7	374.8	376.1	376.4	376.7	376.3
19.....	375.2	374.5	375.1	374.9	376.0	375.0	374.9	374.8	376.4	376.2	376.8	375.8
20.....	375.1	374.4	375.2	375.0	375.6	374.9	375.0	374.7	376.4	376.1	376.6	375.4
21.....	375.3	374.3	375.3	375.1	375.4	374.8	375.0	374.7	376.2	376.1	376.5	375.2
22.....	375.2	374.2	375.3	375.1	375.3	375.0	374.9	374.7	376.0	376.0	377.6	375.3
23.....	375.2	374.1	375.4	375.0	375.2	375.2	374.9	374.8	375.9	376.0	377.8	375.4
24.....	375.1	374.0	375.2	375.0	375.0	375.2	375.0	374.9	375.7	375.9	377.9	375.3
25.....	375.0	374.3	375.1	374.9	375.1	375.4	374.9	374.9	375.7	376.0	378.1	375.2
26.....	375.0	374.4	375.5	374.9	375.0	375.5	375.1	374.9	375.6	376.1	378.2	375.2
27.....	374.9	374.3	375.7	375.0	374.9	375.4	375.1	374.8	375.6	376.3	378.1	375.1
28.....	375.0	374.2	375.7	375.1	374.8	375.3	375.0	374.8	375.5	376.6	377.6	376.2
29.....	375.1	374.4	375.7	375.2	374.8	375.0	374.9	.....	375.7	376.8	377.5	375.3
30.....	375.0	374.3	375.7	375.2	374.7	374.8	374.9	.....	375.8	376.7	377.3	375.4
31.....	374.9	374.2	.....	375.4	.....	374.7	374.9	.....	376.0	.....	377.2	.....

SENECA RIVER ABOVE DAM, BALDWINSVILLE

Gage No. 199

This station, located above the dam in the Seneca river at Baldwinsville 12.5 miles above the confluence of the Seneca and Oneida rivers at Three River Point, was established November 12, 1898, by the United States Deep Waterways Survey, and is now maintained by this Department.

At Baldwinsville the old dam, crest elevation 372.28, has been raised in connection with the construction of the Barge canal by the addition of an ogee concrete crest having a total length of 352 feet at elevation 374.0, and an automatic sluice-gate having a clear opening 50 feet wide designed to open as the water-surface above the dam rises, has replaced the necessary amount of old crest at the north end of the dam.

The gage, a staff located on the upper approach wall to lock No. 24, was replaced on August 26, 1916, by a standard Type B gage, No. 199, secured to the west end of the north retaining wall above lock No. 24, and having a range of 12 feet, between elevations 369.0 and 381.0. A standard bench-mark plug was set in the face of the wall near the gage at elevation 378.0 (B. C. datum).

The gage is read twice daily — at 8 A. M. and 4 P. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER ABOVE DAM AT BALDWINVILLE, for the year ended June 30, 1919. H. C. Fay, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	374.88	374.55	374.55	375.15	375.00	374.78	374.70	374.60	374.80	375.58	375.88	376.30
2	374.70	374.40	374.58	375.15	375.02	374.75	374.78	374.65	374.90	375.52	375.88	376.15
3	374.75	374.32	374.52	375.15	375.12	374.52	374.82	374.58	374.82	375.55	375.95	375.65
4	375.22	374.52	374.35	375.12	375.00	374.28	375.18	374.58	374.70	375.68	376.00	375.45
5	375.28	374.52	374.32	375.15	374.92	374.20	375.98	374.60	374.72	375.82	375.82	375.18
6	375.28	374.52	374.35	375.42	374.85	374.20	374.78	374.55	374.58	375.95	375.75	375.02
7	375.30	374.40	374.35	375.35	374.92	374.25	374.72	374.60	374.55	375.90	375.72	375.35
8	374.95	374.35	374.45	375.20	374.98	374.45	374.70	374.45	374.58	375.90	375.55	375.62
9	374.70	374.38	374.55	375.08	374.95	374.58	374.60	374.50	374.85	375.90	375.58	375.78
10	374.88	374.40	374.50	375.00	375.08	374.48	374.60	374.42	375.22	375.95	375.60	376.02
11	375.02	374.65	374.58	374.95	374.92	374.50	374.50	374.32	375.38	376.05	376.20	376.12
12	375.15	374.52	374.68	374.95	374.82	374.48	374.60	374.38	375.30	376.75	376.62	376.05
13	375.15	374.42	374.68	375.10	374.85	374.72	374.58	374.32	375.00	376.85	376.72	375.88
14	375.15	374.32	374.62	375.02	374.85	374.75	374.58	374.32	374.80	376.50	376.62	375.85
15	375.08	374.25	374.80	374.90	374.80	375.15	374.65	374.45	374.72	376.20	376.35	375.80
16	375.00	374.22	374.72	374.95	374.85	375.15	374.62	374.80	374.82	375.95	376.05	375.75
17	375.00	374.20	374.75	374.80	375.02	375.08	374.60	374.62	375.15	375.85	375.95	375.80
18	374.95	374.35	374.72	374.72	375.28	374.92	374.60	374.52	375.65	375.70	376.12	375.68
19	374.85	374.30	374.78	374.78	375.50	374.78	374.75	374.52	375.78	375.60	376.05	375.25
20	374.90	374.28	374.88	374.95	375.22	374.72	374.68	374.40	375.78	375.62	375.85	375.05
21	375.00	374.20	375.08	374.85	375.10	374.78	374.60	374.40	375.65	375.58	375.90	375.00
22	375.02	374.00	375.20	374.75	375.00	374.92	374.62	374.45	375.50	375.50	376.08	375.02
23	374.88	373.98	375.05	374.70	375.00	374.95	374.62	374.78	375.50	375.45	376.58	374.98
24	374.85	373.95	374.90	374.70	374.92	374.78	374.85	374.70	375.32	375.48	376.68	374.98
25	374.78	374.20	374.80	374.68	374.88	375.18	374.82	374.58	375.20	375.55	376.85	374.85
26	374.80	374.22	375.18	374.80	374.60	375.15	374.90	374.75	375.18	375.70	376.80	374.88
27	374.65	374.18	375.32	375.15	374.58	375.08	374.82	374.62	375.15	375.92	376.62	374.90
28	374.80	374.12	375.32	375.05	374.52	374.92	374.75	374.68	375.28	376.00	376.30	375.05
29	374.78	374.18	375.48	374.92	374.62	375.05	374.75	.....	375.38	376.05	376.08	375.10
30	374.65	374.12	375.25	374.85	374.52	374.72	374.78	.....	375.58	376.02	376.22	375.05
31	374.58	374.20	.....	374.95	.....	374.52	374.68	.....	375.58	.....	376.28	.....

SENECA RIVER BELOW DAM, BALDWINSVILLE

Gage No. 128

This station, located below the dam in the Seneca river at Baldwinsville, was established November 12, 1898, by the United States Deep Waterways Survey and is now maintained by this Department. The gage, a staff located on the lower approach wall to lock No. 24, was replaced on July 25, 1916, by a standard Type A gage, No. 198, in two sections. The lower section is secured to the lower north approach wall, under the Syracuse street bridge, and has a range of 8 feet, between elevations 361.0 and 369.0. The upper section is secured to the north abutment of the Syracuse street bridge and has a range of 4 feet, between elevations 369.0 and 373.0. The gage bench-mark is a square chiseled mark on the northwest concrete stair railing, lock No. 24, and is at elevation 371.94 (B. C. datum).

The gage is read twice daily—at 8 A. M. and 4 P. M.—to half-tenths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER BELOW DAM AT BALDWINSVILLE, for the year ended June 30, 1919. H. C. Fay, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	364.00	363.92	363.35	364.32	364.48	364.15	363.88	364.10	364.15	365.02	365.70	366.10
2.....	363.70	363.85	363.65	364.28	364.38	364.18	364.25	364.00	364.22	364.95	365.80	366.05
3.....	363.82	363.72	363.68	364.25	364.35	364.10	364.28	364.02	364.50	365.02	365.60	365.40
4.....	363.90	363.78	363.65	364.22	364.52	364.00	364.28	364.10	364.50	365.22	365.35	364.75
5.....	363.92	363.98	363.60	364.25	364.40	363.90	364.22	364.12	364.45	365.42	365.35	364.50
6.....	363.90	363.90	363.55	364.28	364.32	363.95	364.28	364.15	364.52	365.40	365.35	364.28
7.....	363.85	363.92	363.50	364.58	364.22	364.05	364.20	364.32	364.40	365.30	365.30	364.38
8.....	363.80	363.80	362.40	364.52	364.12	363.88	364.10	364.35	364.32	365.35	365.10	364.60
9.....	363.75	363.92	363.75	364.38	364.12	364.05	361.10	364.20	364.50	365.55	364.90	364.80
10.....	363.85	363.90	363.55	364.22	364.00	364.15	364.10	364.20	365.15	365.60	364.95	365.00
11.....	364.08	363.90	363.68	364.20	364.02	364.12	364.08	364.08	365.35	365.90	365.62	365.25
12.....	364.10	364.05	363.70	364.30	364.18	363.95	364.00	364.00	365.25	366.65	366.12	365.18
1.....	364.08	363.92	363.82	364.28	364.08	364.10	364.02	363.95	365.00	367.20	366.58	364.95
2.....	364.00	363.80	363.80	364.28	364.00	364.40	364.10	364.25	364.92	367.12	366.58	364.72
3.....	364.00	363.72	363.75	364.10	364.12	364.40	364.35	364.22	364.75	366.75	366.35	364.70
4.....	364.00	363.68	364.00	364.08	364.22	364.48	364.25	364.00	364.62	366.25	365.78	364.65
5.....	364.00	363.58	364.00	364.15	364.42	364.42	364.25	364.18	364.95	365.95	365.40	364.80
6.....	363.92	363.58	364.05	364.00	364.48	364.25	364.30	364.10	365.30	365.65	365.52	364.65
7.....	363.90	363.80	364.10	364.00	364.55	364.15	364.30	364.05	365.52	365.42	365.58	364.42
8.....	363.90	363.72	364.22	364.10	364.48	364.10	364.30	363.95	365.58	365.25	365.48	364.12
9.....	363.90	363.68	364.32	364.12	364.32	364.05	364.22	363.90	365.50	365.28	365.50	364.02
10.....	364.12	363.65	364.30	364.10	364.10	364.12	364.20	363.75	365.28	365.32	365.58	363.92
11.....	364.00	363.58	364.38	364.02	364.10	364.25	364.20	363.80	365.00	365.30	366.22	364.12
12.....	364.00	363.42	364.10	364.02	363.98	364.38	364.42	364.10	365.02	365.30	366.75	364.18
1.....	364.10	363.35	364.32	364.08	364.05	364.42	364.40	364.22	365.00	365.28	367.00	364.22
2.....	364.12	363.62	364.38	364.05	364.10	364.52	364.40	364.30	364.92	365.30	367.20	364.08
3.....	364.02	363.62	364.30	364.28	364.08	364.42	364.28	364.20	364.90	365.40	367.05	364.00
4.....	363.98	363.58	364.50	364.30	364.05	364.28	364.20	364.10	364.78	365.48	366.80	364.12
5.....	364.20	363.48	364.38	364.25	364.00	364.08	364.20	.....	364.85	365.68	366.38	364.20
6.....	364.18	363.42	364.38	364.10	363.98	364.12	364.12	.....	364.90	365.75	366.18	364.10
7.....	364.02	363.32	.....	364.35	.....	363.98	364.12	.....	365.06	.....	366.12	.....

SENECA RIVER AT BELGIUM

Gage No. 196

This station is located at the highway bridge across the Seneca river at Belgium. It was established April 14, 1904. The staff gage, located on the docking on the right bank of the stream, a short distance above the highway bridge, was superseded in March, 1916, by a chain gage on the new bridge.

On October 17, 1917, a standard Type A gage, No. 196, was erected on the upstream face of the north abutment, having a range of 8 feet, between elevations 363.0 and 371.0. State bench-mark No. 56 is a copper plug in the door-sill of a brick building 50 feet north of the east abutment of the bridge, and is at elevation 370.368 (B. C. datum).

The gage is read once daily — A. M. — to hundredths.

Daily elevation of water-surface (B. C. datum) of SENECA RIVER AT BELGIUM, for the year ended June 30, 1919. A. R. Gates, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.86	363.88	363.30	364.11	364.26	363.79	363.84	363.99	364.12	364.75	365.20	365.14
2.....	363.66	363.80	363.65	364.08	364.19	364.11	364.12	363.91	364.23	364.70	365.40	365.10
3.....	363.68	363.71	363.59	364.05	364.22	363.98	364.16	363.94	364.40	364.66	365.10	364.89
4.....	363.86	363.71	363.60	364.02	364.33	363.91	364.14	364.10	364.38	364.80	364.94	364.39
5.....	363.84	363.95	363.52	364.06	364.22	363.80	364.00	364.60	364.38	365.50	364.85	364.30
6.....	363.80	363.85	363.51	364.14	364.15	363.90	364.11	364.10	364.40	364.93	364.94	364.10
7.....	363.80	363.80	363.44	364.29	364.09	363.97	363.97	364.29	364.30	364.88	364.90	364.12
8.....	363.71	363.75	363.40	364.26	364.01	363.86	363.98	364.31	364.25	364.86	364.80	364.30
9.....	363.64	363.80	363.69	364.16	364.02	364.00	363.98	364.15	364.27	365.80	364.60	364.39
10.....	363.74	363.81	363.58	364.06	363.93	364.06	363.97	364.80	364.88	365.60	364.79	364.44
11.....	363.90	363.65	363.58	363.95	363.92	364.06	363.91	363.96	365.20	365.26	365.60	364.65
12.....	363.96	364.10	363.56	364.02	364.06	363.86	364.25	363.94	364.95	365.73	365.20	364.56
13.....	363.91	363.89	363.72	364.21	363.92	363.95	364.39	363.86	364.85	366.14	365.60	364.40
14.....	363.91	366.76	363.66	364.11	363.81	364.28	364.25	364.15	364.72	366.20	365.65	364.24
15.....	363.91	363.70	363.70	363.96	364.00	364.33	364.26	364.14	364.63	365.94	365.45	364.23
16.....	363.87	363.60	363.90	364.01	364.14	364.29	364.17	364.30	364.50	365.60	365.11	364.21
17.....	363.99	363.58	363.93	364.01	364.11	364.26	364.11	364.70	364.69	365.34	364.90	364.29
18.....	363.82	366.55	363.90	363.92	364.32	364.15	364.00	364.00	364.92	365.14	364.98	364.38
19.....	363.82	363.71	363.98	363.93	364.28	364.05	364.11	363.94	365.17	365.95	364.95	364.19
20.....	363.81	363.69	364.16	363.92	364.27	363.99	364.15	363.84	366.22	364.90	365.00	363.91
21.....	363.60	363.60	364.21	363.99	364.11	364.07	364.96	363.78	365.16	364.81	364.95	363.93
22.....	364.50	363.59	364.21	363.99	363.95	364.04	364.50	363.74	364.99	365.50	364.94	363.83
23.....	363.90	363.56	364.29	363.99	364.01	364.05	364.50	363.74	364.84	366.50	365.23	363.95
24.....	363.92	363.45	364.16	363.98	363.95	364.21	364.33	364.60	364.75	365.40	365.48	364.60
25.....	363.99	363.24	364.11	363.98	363.86	364.84	364.26	364.15	364.80	365.60	365.53	364.00
26.....	364.00	363.55	364.20	364.10	363.88	364.32	364.20	364.21	364.70	365.10	365.94	363.90
27.....	363.99	363.50	364.24	364.18	363.97	364.26	364.16	364.16	364.71	365.76	365.94	363.82
28.....	363.95	363.50	364.32	364.15	363.90	364.10	364.14	364.50	364.63	364.97	365.78	363.95
29.....	364.10	363.45	364.25	364.11	363.86	364.00	364.12	.....	364.66	365.16	365.48	364.60
30.....	364.00	363.32	364.21	364.05	363.82	363.93	364.70	.....	364.72	365.22	365.25	363.91
31.....	363.98	363.29	.....	364.25	.....	363.90	364.30	.....	364.75	.....	365.18	.....

KEUKA LAKE

DESCRIPTION

Keuka, or "Crooked," lake is one of the finger group of lakes in central New York. It lies west of the southerly part of Seneca lake, into which it drains. The lake is long and narrow, lying generally in a north and south direction, the northerly portion being divided into two approximately parallel branches. The shores of the lake rise rather abruptly from the water's edge. It has a total drainage area of 178.47 square miles, of which 17.51 square miles, or 9.8 per cent, is water-surface.

The lake is retained by a State dam in the outlet at Penn Yan. The outflow of the lake is practically controlled by the flow through two mills located at each end of the State dam, the water only occasionally flowing over the crest. This lake has a natural range of about 6 feet and according to occasional records of a gage maintained on the outlet about a fourth of a mile above the State dam by Mr. W. N. Wise of Penn Yan, the surface rose to 4 feet above the crest of the dam in April, 1870, and fell to 6 feet below the crest in December, 1899, giving an extreme range of 10 feet. The surface of the lake is at elevation about 715, Barge canal datum.

KEUKA LAKE AT PENN YAN

Gage No. 211

This station is located at Penn Yan at the foot of Keuka lake. It was established January 1, 1915, to determine lake level. The gage is located on the outlet about $\frac{3}{4}$ mile from the lake and above the State dam. It is a staff attached to a pile near the right bank about 100 feet above the upper bridge. The gage is read once daily — at 8 A. M. — to tenths. Gage heights only are published, as Barge canal levels have not as yet been extended to this locality. For earlier records in this vicinity see Keuka lake description.

Daily gage height, in feet, of KEUKA LAKE AT PENN YAN, for the year ended June 30
1919. E. F. Garbus, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	6.3	5.5	4.5	4.2	3.7	3.5	3.4	3.0	2.7	3.3	4.3
2.....	6.2	5.4	4.4	4.2	3.7	3.5	3.3	3.0	2.7	3.3	4.5
3.....	6.2	5.4	4.4	4.2	3.6	3.5	3.3	3.0	2.7	3.3	4.5
4.....	6.2	5.4	4.4	4.1	3.6	3.5	3.3	3.0	2.7	3.4	4.5
5.....	6.2	5.3	4.3	4.1	3.6	3.6	3.3	3.0	2.7	3.4	4.5
6.....	6.2	5.3	4.3	4.1	3.6	3.5	3.3	3.0	2.7	3.4	4.5
7.....	6.1	5.3	4.3	4.1	3.6	3.5	3.3	3.0	2.7	3.5	4.5
8.....	6.1	5.3	4.2	4.1	3.6	3.5	3.3	3.0	2.7	3.5	4.5
9.....	6.1	5.2	4.2	4.0	3.6	3.5	3.3	2.9	2.9	3.5	4.5
10.....	6.1	5.2	4.2	4.0	3.5	3.4	3.2	2.9	2.9	3.6	4.7
11.....	6.0	5.2	4.1	4.0	3.5	3.4	3.2	2.9	2.9	3.8	5.3
12.....	6.0	5.1	4.1	4.0	3.5	3.4	3.2	2.9	2.9	4.0	5.4
13.....	6.0	5.1	4.1	3.9	3.5	3.4	3.2	2.9	2.9	4.0	5.5
14.....	6.0	5.1	4.1	3.9	3.5	3.4	3.2	2.9	2.9	4.1	5.6
15.....	5.9	5.0	4.1	3.9	3.4	3.4	3.2	2.9	2.9	4.1	5.6
16.....	5.9	5.0	4.1	3.9	3.4	3.4	3.2	2.8	2.9	4.1	5.6
17.....	5.9	5.0	4.1	3.8	3.4	3.2	3.1	2.8	3.1	4.1	5.7
18.....	5.8	4.9	4.1	3.8	3.7	3.3	3.1	2.8	3.2	4.1	5.7
19.....	5.8	4.9	4.1	3.8	3.7	3.3	3.1	2.8	3.2	4.1	5.7
20.....	5.8	4.9	4.3	3.8	3.7	3.3	3.1	2.8	3.2	4.1	5.7
21.....	5.8	4.8	4.3	3.7	3.7	3.3	3.1	2.8	3.2	4.1	6.0
22.....	5.8	4.8	4.3	3.7	3.7	3.3	3.1	2.8	3.2	4.1	6.3
23.....	5.7	4.8	4.3	3.7	3.7	3.3	3.1	2.8	3.2	4.2	6.7
24.....	5.7	4.7	4.3	3.7	3.6	3.3	3.1	2.8	3.2	4.2	7.0
25.....	5.7	4.7	4.3	3.6	3.6	3.3	3.1	2.8	3.2	4.2	7.2
26.....	5.6	4.7	4.3	3.6	3.6	3.3	3.0	2.8	3.2	4.3	7.2
27.....	5.6	4.6	4.3	3.6	3.6	3.3	3.0	2.7	3.3	4.3	7.2
28.....	5.6	4.6	4.3	3.6	3.6	3.3	3.0	2.7	3.3	4.3	7.2
29.....	5.6	4.6	4.2	3.6	3.6	3.4	3.0	.....	3.3	4.3	7.2
30.....	5.5	4.5	4.2	3.7	3.6	3.4	3.0	.....	3.3	4.3	7.2
31.....	5.5	4.5	.....	3.7	.....	3.4	3.0	.....	3.3	.....	7.2

NOTE.— This station discontinued May 31, 1919.

SENECA LAKE

DESCRIPTION

Seneca lake, the largest and deepest of the finger group lakes of central New York, has a length of about 34.4 miles and a width varying from 1 to 3 miles. The area draining directly into Seneca lake, exclusive of Keuka lake above its outlet, is 529.62 square miles, of which 67.16 square miles, or 12.7 per cent, is water-surface. The total drainage above the outlet at Seneca lake, including Keuka lake, is 708.09 square miles, of which 84.67 square miles, or 12 per cent, is water-surface.

This lake has the usual alluvial fan at its south end which is characteristic of these glacial lakes.

Records of water-surface fluctuations are available, as follows:

Two records in 1841 and at varying intervals from June, 1844, to December, 1846, referred to the bottom of the Geneva level, are found in the testimony of O. W. Childs, Esq., Chief Engineer, in publication entitled "Canal Frauds," Assembly document No. 100 (New York State), February 17, 1847, pp. 264-5.

1891 and 1910, inclusive, records at varying intervals of a gage maintained by Mr. Chas. W. Ingalls at Watkins.

1900-1905, inclusive, observations at irregular intervals will be found in the records of the City Engineer's office, Geneva.

March, 1901, to October, 1904, inclusive, observations made by the State Engineering Department during the construction of the regulating works in the outlet about 1,500 feet from the lake.

1907 to 1909, inclusive, weekly records taken at the Geneva pumping station on Wednesday nights.

August, 1909, to December, 1914, inclusive, records of the gage maintained by the State Engineer's Department above the guard-gate in outlet about 1,500 feet from the lake.

September 21, 1912, to June 30, 1919, at Watkins.

January 1, 1915, to June 30, 1919, at Geneva.

The discharge from and the surface of this lake is controlled by regulating works at Waterloo, about 5 miles from the lake, constructed in connection with the canalization of the Seneca river for the Barge canal. These works consist of six Taintor gates, each having a clear span of 36 feet.

For this lake certain water-surface elevations were assumed for use in the design of the Barge canal. These elevations, referred to Barge canal datum, are as follows: Average high water, elevation 447.0; canal pool, or low navigable stage, elevation 445.0; average low water, elevation 444.5. By average surface is meant the surface unaffected by wind.

SENECA LAKE AT WATKINS

Gage No. 209

This station, established September 21, 1912, is located at the head, or south end of Seneca lake. The gage was originally located at the Fourth street bridge over the canal. On January 1, 1915, a direct-reading staff was located on McAnarney's dock. On July 12, 1916, a standard Type A gage, No. 209, was erected on docking at end of boat slip back of Lembeck and Betz' malt house. It has a range of 8 feet, between elevations 442.0 and 450.0. The gage bench-mark is the top of concrete foundation, northeast corner of Lembeck and Betz' boiler room and is at elevation 453.465 (B. C. datum).

The gage is read once daily — at noon — to even hundredths.

Daily elevation of water-surface (B. C. datum) of SENECA LAKE AT WATKINS, for the year ended June 30, 1919. Fred Wright, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	446.76	446.10	445.34	444.80	444.50	444.50	444.30	443.88	443.48	444.18	445.40	447.44
2.	446.74	446.08	445.30	444.80	444.50	444.50	444.30	443.88	443.48	444.20	445.40	447.44
3.	446.72	446.06	445.28	444.80	444.50	444.48	444.30	443.88	443.48	444.22	445.40	447.44
4.	446.70	446.04	445.22	444.80	444.50	444.46	444.30	443.86	443.48	444.24	445.50	447.44
5.	446.68	446.02	445.18	444.78	444.50	444.44	444.30	443.84	443.48	444.26	445.60	447.44
6.	446.66	446.00	445.14	444.76	444.50	444.42	444.30	443.82	443.48	444.30	445.60	447.44
7.	446.64	445.98	445.10	444.74	444.50	444.40	444.28	443.80	443.48	444.40	445.60	447.44
8.	446.62	445.96	445.06	444.72	444.50	444.40	444.26	443.78	443.48	444.50	445.60	447.44
9.	446.60	445.94	445.02	444.70	444.50	444.40	444.24	443.78	443.50	444.60	445.60	447.44
10.	446.58	445.92	444.98	444.70	444.50	444.38	444.22	443.78	443.52	444.70	445.74	447.44
11.	446.56	445.90	444.94	444.70	444.50	444.36	444.20	443.78	443.54	444.80	446.00	447.42
12.	446.54	445.88	444.90	444.70	444.50	444.34	444.18	443.76	443.56	444.90	446.20	447.40
13.	446.52	445.86	444.86	444.70	444.50	444.32	444.17	443.74	443.58	444.98	446.30	447.34
14.	446.50	445.84	444.82	444.70	444.50	444.30	444.16	443.72	443.60	445.00	446.34	447.30
15.	446.48	445.82	444.78	444.70	444.50	444.30	444.14	443.70	443.62	445.02	446.34	447.28
16.	446.46	445.80	444.74	444.70	444.50	444.30	444.12	443.68	443.70	445.04	446.38	447.24
17.	446.44	445.78	444.70	444.70	444.50	444.30	444.12	443.66	443.80	445.10	446.40	447.22
18.	446.42	445.76	444.70	444.70	444.50	444.30	444.12	443.64	443.90	445.14	446.50	447.20
19.	446.40	445.74	444.70	444.70	444.50	444.30	444.12	443.62	443.98	445.20	446.51	447.18
20.	446.38	445.72	444.90	444.68	444.50	444.30	444.12	443.60	444.00	445.20	446.51	447.14
21.	446.36	445.70	444.90	444.66	444.50	444.30	444.10	443.58	444.00	445.20	446.51	447.12
22.	446.30	445.68	444.80	444.64	444.50	444.30	444.08	443.56	444.00	445.20	446.70	447.10
23.	446.28	445.64	444.80	444.62	444.50	444.30	444.06	443.54	444.00	445.20	447.00	447.08
24.	446.26	445.62	444.80	444.60	444.50	444.30	444.04	443.52	444.00	445.20	447.10	447.06
25.	446.24	445.68	444.80	444.58	444.50	444.30	444.02	443.50	444.00	445.20	447.30	447.04
26.	446.22	445.54	444.80	444.56	444.50	444.30	444.00	443.48	444.00	445.20	447.30	447.00
27.	446.20	445.50	444.80	444.54	444.50	444.30	443.98	443.48	444.00	445.30	447.40	447.00
28.	446.18	445.46	444.80	444.52	444.50	444.30	443.96	443.48	444.04	445.36	447.41	447.00
29.	446.16	445.42	444.80	444.50	444.50	444.30	443.94	.....	444.08	445.40	447.41	447.00
30.	446.14	445.40	444.80	444.50	444.50	444.30	443.92	.....	444.10	445.40	447.44	447.00
31.	446.12	445.38	.....	444.50	.....	444.30	443.90	.....	444.10	.....	447.44	.....

SENECA LAKE AT GENEVA

Gage No. 208

This station was established January 1, 1915, and was originally located near Castle street in the old Cayuga and Seneca canal harbor, but on March 19, 1915, it was moved to the Cayuga and Seneca canal just north of Lake street. The staff gage formerly used was replaced on July 14, 1916, by a standard Type A gage. This gage, No. 208, is secured to the east harbor wall just above the Lake street bridge, and has a range of 8 feet, between elevations 442.0 and 450.0. A standard bench-mark plug is set in the face of the wall near the gage, at elevation 449.0 (B. C. datum).

This station replaces the station formerly maintained in the Seneca river above the guard-gate about 1,500 feet below the mouth of Seneca lake.

The gage is read once daily — at noon — to half-tenths and even hundredths.

Daily elevation of water-surface (B. C. datum) of SENECA LAKE AT GENEVA, for the year ended June 30, 1919. T. C. McNicholas, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	446.7	445.96	445.08	444.74	444.50	444.50	444.24	443.90	443.48	444.08	445.38	447.40
2.....	446.6	445.96	445.10	444.82	444.52	444.38	444.38	443.88	443.50	444.18	445.38	447.40
3.....	446.55	445.88	445.12	444.72	444.48	444.36	444.28	443.85	443.46	444.20	445.38	447.38
4.....	446.68	445.88	445.02	444.75	444.48	444.32	444.34	443.84	443.50	444.22	445.34	447.35
5.....	446.65	445.9	445.05	444.78	444.46	444.30	444.34	443.82	443.05	444.30	445.30	447.38
6.....	446.6	445.84	444.95	444.80	444.44	444.28	444.30	443.80	443.40	444.30	445.28	447.35
7.....	446.56	445.82	444.92	444.80	444.42	444.32	444.25	443.76	443.46	444.28	445.30	447.35
8.....	446.5	445.76	444.88	444.76	444.44	444.30	444.25	443.74	443.52	444.28	445.32	447.38
9.....	446.45	445.95	444.84	444.75	444.44	444.26	444.12	443.72	443.60	444.28	445.34	447.45
10.....	446.42	445.90	444.80	444.72	444.42	444.20	444.20	443.70	443.60	444.38	445.65	447.38
11.....	446.42	445.90	444.76	444.70	444.44	444.40	444.12	443.70	443.60	444.70	446.00	447.36
12.....	446.45	445.85	444.78	444.72	444.44	444.36	444.10	443.72	443.56	444.80	446.12	447.34
13.....	446.44	445.80	444.68	444.72	444.46	444.28	444.12	443.72	443.68	444.90	446.26	447.32
14.....	446.42	445.80	444.65	444.78	444.42	444.20	444.10	443.72	443.65	445.00	446.30	447.28
15.....	446.38	445.76	444.61	444.70	444.35	444.32	444.08	443.65	443.68	444.98	446.32	447.25
16.....	446.36	445.68	444.62	444.60	444.45	444.36	444.06	443.62	443.90	445.00	446.34	447.22
17.....	446.35	445.68	444.68	444.72	444.44	444.34	444.06	443.60	443.85	445.14	441.40	447.18
18.....	446.32	445.62	444.68	444.55	444.52	444.30	444.06	443.60	443.85	445.10	446.46	447.08
19.....	446.26	445.64	444.72	444.60	444.55	444.30	444.04	443.58	443.90	445.20	446.48	447.06
20.....	446.22	445.56	444.78	444.68	444.46	444.28	444.04	443.56	443.86	445.20	446.42	447.05
21.....	446.20	445.52	444.84	a	444.56	444.28	444.02	443.72	444.00	445.20	446.55	446.95
22.....	446.18	445.42	444.80	a	444.52	444.36	444.02	443.76	444.00	445.20	446.72	447.00
23.....	446.18	445.40	444.82	a	444.52	444.40	444.06	443.52	443.95	445.16	446.90	447.05
24.....	446.15	445.38	444.82	a	444.54	444.36	443.96	443.45	443.90	445.18	447.08	447.08
25.....	446.15	445.35	444.78	a	444.46	444.34	443.94	443.60	443.96	445.16	447.24	447.10
26.....	446.15	445.32	444.80	a	444.44	444.30	443.95	443.46	443.98	445.18	447.30	447.10
27.....	446.15	445.28	444.78	444.52	444.40	444.25	443.95	443.56	444.00	445.18	447.38	446.94
28.....	446.18	445.40	444.75	444.56	444.50	444.30	443.94	443.54	444.00	445.22	447.35	446.94
29.....	446.16	445.18	444.75	444.60	444.36	444.25	443.90	.....	444.00	445.23	447.40	446.92
30.....	446.04	445.12	444.80	444.48	444.38	444.22	443.94	.....	444.00	445.30	447.38	446.96
31.....	445.96	445.12	.....	444.60	.....	444.22	443.90	.....	444.00	.....	447.38	.....

a No record.

CAYUGA LAKE

DESCRIPTION

Cayuga lake, the second in size of the finger lakes in central New York, has a length of about $37\frac{1}{2}$ miles and a width varying from 1 to 3 miles, and lies generally in a north and south direction. It has the usual abruptly rising shores and the alluvial fan at its head, or south end. The territory draining directly into this lake, exclusive of Seneca lake, has an area of 863.57 square miles, of which 66.31 square miles, or 7.7 per cent, is water-surface. The total drainage above the outlet of Cayuga lake, including Keuka and Seneca lakes, is 1,571.66 square miles, of which the total water-surface of the three lakes amounts to 150.98 square miles, or 9.6 per cent.

The southeast portion of this watershed, drained by Fall creek, lies south and east of a large portion of the Owasco lake drainage basin and extends almost to the southern end of Skaneateles lake.

Seneca river enters the foot of Cayuga lake from the west and leaves it near the east side at the new controlling works, about 2 miles north of Cayuga, built in connection with the Barge canal. These works consist of 6 Taintor gates, each having a clear span of 30 feet.

For this lake certain water-surface elevations were assumed for use in the design of the Barge canal. These elevations, referred to Barge canal datum, are as follows: Average high water, elevation 384.0; canal pool, or low navigable stage, elevation 381.5; average low water, elevation 380.0. By average surface is meant the water-surface unaffected by wind.

Records of water-surface fluctuations in this lake in addition to those previously published in various reports of the Department of State Engineer, of gages maintained at Ithaca, Cayuga and Mud lock, are those of Professor C. L. Crandall of Cornell University, Ithaca, which consist of observations at varying intervals, beginning January, 1879.

REPORT OF STATE ENGINEER

CAYUGA LAKE AT ITHACA

Gage No. 207

This station was established August 6, 1905, and maintained by the United States Geological Survey until 1909. During the year 1909 it was taken over by this Department.

The original gage was on the breakwater at the head of Cayuga lake and about 150 feet from the lighthouse. The gage was moved about November 1, 1912, to Smith's boat-house opposite the Cornell boat-house about a mile up the inlet and remained at this place until December 19, 1914, when it was abandoned. It was reestablished January 23, 1915, at its present location. On July 11, 1916, a standard Type A gage, No. 207, was erected on the south side of Lane's dock at Willow Point, on the east shore about $\frac{3}{4}$ mile from the head of the lake. It has a range of 6 feet, between elevations 381.0 and 387.0. The gage bench-mark is a nail in the root of a buttonwood tree, north of Lane's boat-house, and is at elevation 387.50 (B. C. datum).

The gage is read once daily — A. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of CAYUGA LAKE AT WILLOW POINT, NEAR ITHACA, for the year ended June 30, 1919. William H. Lane, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	383.65	383.5	383.6	383.2	382.4	382.3	383.25	383.05	382.85	382.8	383.6	384.9
2.....	383.65	383.5	383.6	383.15	382.35	382.3	383.3	383.05	382.85	382.75	383.55	384.8
3.....	383.7	383.5	383.6	383.1	382.3	382.3	383.3	383.0	382.9	382.7	383.55	384.75
4.....	383.7	383.5	383.6	383.1	382.3	382.3	383.35	383.0	382.9	382.7	383.5	384.75
5.....	383.7	383.5	383.65	383.0	382.3	382.35	383.35	383.0	382.9	382.75	383.5	384.7
6.....	383.7	383.5	383.65	382.9	382.25	382.35	383.35	383.0	382.9	382.8	383.45	384.7
7.....	383.7	383.5	383.6	382.8	382.25	382.35	383.3	382.95	382.95	382.9	383.4	384.7
8.....	383.75	383.5	383.6	382.75	382.2	382.4	383.8	382.95	382.95	382.9	383.4	384.7
9.....	383.75	383.6	383.6	382.7	382.2	382.45	383.3	382.9	382.95	383.1	383.35	384.65
10.....	383.75	383.7	383.55	382.65	382.2	382.45	383.25	382.9	382.95	383.1	383.6	384.65
11.....	383.75	383.7	383.55	382.6	382.2	382.5	383.25	382.9	383.0	383.2	383.8	384.65
12.....	383.7	383.7	383.55	382.55	382.15	382.55	383.25	382.85	383.0	383.3	383.9	384.6
13.....	383.7	383.7	383.52	382.5	382.15	382.6	383.2	382.85	383.0	383.4	384.0	384.6
14.....	383.7	383.7	383.52	382.45	382.1	382.65	383.2	382.85	383.0	383.5	384.1	384.6
15.....	383.7	383.65	383.5	382.4	382.1	382.7	383.2	382.9	383.0	383.55	384.2	384.55
16.....	383.65	383.65	383.5	382.35	382.05	382.7	383.2	382.9	383.0	383.6	384.3	384.5
17.....	383.65	383.65	383.52	382.3	382.05	382.75	383.15	382.9	383.1	383.6	384.3	384.45
18.....	383.6	383.65	383.55	382.25	382.1	382.8	383.15	382.9	383.15	383.65	384.4	384.4
19.....	383.65	383.65	383.55	382.2	382.15	382.8	383.15	382.85	383.2	383.65	384.45	384.45
20.....	383.6	383.6	383.55	382.15	382.2	382.8	383.15	382.85	383.2	383.7	384.5	384.5
21.....	383.6	383.65	383.6	382.1	382.2	382.85	383.2	382.85	383.2	383.7	384.5	384.5
22.....	383.6	383.65	383.6	382.1	382.25	382.9	383.2	382.85	383.0	383.7	384.55	384.45
23.....	383.6	383.65	383.6	382.1	382.25	382.95	383.2	382.8	383.1	383.7	384.55	384.4
24.....	383.55	383.65	383.55	382.1	382.3	382.95	383.2	382.8	383.0	383.65	385.0	384.35
25.....	383.55	383.6	383.5	382.0	382.3	383.0	383.2	382.8	383.0	383.65	385.2	384.35
26.....	383.55	383.6	383.5	382.0	382.3	383.1	383.15	382.8	383.0	383.65	385.3	384.4
27.....	383.55	383.6	383.45	382.0	382.3	383.15	383.15	382.85	383.0	383.6	385.4	384.4
28.....	383.55	383.6	383.45	382.0	382.25	383.2	383.1	382.85	383.0	383.6	385.3	384.4
29.....	383.55	383.6	383.4	382.0	382.25	383.2	383.1	382.85	383.0	383.6	385.2	384.35
30.....	383.55	383.6	383.35	382.1	382.25	383.2	383.1	382.9	383.0	383.6	385.1	384.3
31.....	383.55	383.6	.....	382.2	.....	383.25	383.05	382.9	.....	385.0	.....	.....

CAYUGA LAKE AT CAYUGA

Gage No. 206

This station is located at the village of Cayuga near the foot of Cayuga lake on the east shore. The station was established October 10, 1905, and was originally located near the crossing of the old Cayuga and Seneca canal and the Seneca river. It was moved to its present location May 16, 1914. On October 6, 1916, the direct-reading staff gage, on a pile opposite the N. Y. C. station, was replaced by a standard Type A gage, No. 206, in the same location. It has a range of 8 feet, between elevations 380.0 and 388.0. The gage bench-mark is on the southwest corner of concrete intake tank, on west side of N. Y. C. pumping station, and is at elevation 390.67 (B. C. datum).

The gage is read twice daily—at 7 A. M. and 5 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of CAYUGA LAKE AT CAYUGA, for the year ended June 30, 1919. T. Reagan, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	383.6	383.4	383.5	383.1	382.2	382.2	383.2	382.7	382.7	382.5	383.5	.....
2.....	383.5	383.4	383.5	383.1	382.2	382.2	383.1	382.9	382.7	382.5	383.5	.....
3.....	383.5	383.4	383.5	382.05	382.25	382.2	383.0	382.9	382.7	382.5	383.4	.....
4.....	383.6	383.4	383.4	382.9	382.3	382.1	383.2	382.9	382.8	382.6	383.3	.....
5.....	383.6	383.4	383.5	382.8	382.15	382.2	383.2	383.0	382.8	382.6	383.3	.....
6.....	383.5	383.4	383.5	382.8	382.05	382.1	383.2	383.0	382.7	382.6	383.3	.....
7.....	383.5	383.4	383.5	382.7	382.2	382.4	383.2	383.0	382.7	382.6	383.3	.....
8.....	383.5	383.4	383.5	382.7	382.2	382.3	383.3	383.0	382.7	382.7	383.2	.....
9.....	383.5	383.5	383.5	382.7	382.2	382.3	383.3	382.85	382.8	382.6	383.2	.....
10.....	383.5	383.5	383.5	382.7	382.0	382.3	383.3	382.8	382.8	382.7	383.3	.....
11.....	383.5	383.6	383.5	382.6	382.05	382.7	383.1	382.8	382.7	382.7	383.65	.....
12.....	383.6	383.6	383.4	382.6	382.0	382.35	383.2	382.8	382.85	383.1	383.8	.....
13.....	383.6	383.5	383.4	382.45	382.0	382.4	383.2	382.8	382.8	383.2	383.05	.....
14.....	383.5	383.5	383.4	382.3	381.9	382.5	383.0	382.7	382.9	383.4	384.1	.....
15.....	383.5	383.5	383.3	382.25	381.9	382.5	383.0	382.7	383.0	383.4	384.2	.....
16.....	383.5	383.5	383.3	382.2	381.9	382.7	383.2	382.7	383.3	383.5	384.3	.....
17.....	383.5	383.5	383.3	382.2	381.9	382.6	383.0	382.7	383.1	383.5	384.4	.....
18.....	383.5	383.5	383.4	382.05	382.0	382.7	383.1	382.7	383.0	383.4	384.4	.....
19.....	383.5	383.5	383.4	382.1	382.0	382.7	383.1	382.7	383.0	383.5	384.4	.....
20.....	383.5	383.5	383.5	382.2	382.0	382.7	383.1	382.7	383.1	383.5	384.3	.....
21.....	383.5	383.5	383.5	382.0	382.1	382.8	383.1	382.8	383.0	383.4	384.35	.....
22.....	383.5	383.4	383.45	381.9	382.1	382.9	383.1	382.7	382.9	383.4	384.4	.....
23.....	383.5	383.5	383.4	382.0	382.1	382.8	383.2	382.7	382.9	383.5	384.75	.....
24.....	383.5	383.5	383.4	382.0	382.2	382.9	383.0	382.7	382.8	383.4	384.85	.....
25.....	383.5	383.5	383.5	381.9	382.2	382.9	383.2	382.8	382.9	383.4	385.05	.....
26.....	383.5	383.5	383.4	382.0	382.2	382.8	383.2	382.7	382.8	383.4	385.15	.....
27.....	383.5	383.5	383.4	382.0	382.1	382.95	383.1	382.7	382.7	383.4	385.2	.....
28.....	383.5	383.5	383.4	382.2	382.25	383.0	383.1	382.7	382.5	383.45	385.3	.....
29.....	383.5	383.4	383.25	382.0	382.2	383.0	383.0	.....	382.3	383.4	385.2	.....
30.....	383.5	383.5	383.2	382.0	382.1	383.0	383.1	.....	382.7	383.45	385.1	.....
31.....	383.4	383.5	.....	382.1	.....	383.3	382.9	.....	382.5	.....	384.9	.....

NOTE.—This station discontinued May 31, 1919.

CLYDE RIVER

DESCRIPTION

Clyde river joins Seneca river in the Montezuma marsh near the foot of Cayuga lake. Clyde river is formed by the junction of Canandaigua outlet and Ganargua creek, at Lyons. Its total length is about 20 miles and the greater portion of its course lies through a broad, marshy valley.

It is canalized throughout for the Barge canal and formed into three navigable pools, having low navigable water-surfaces referred to Barge canal datum as follows:

Above its confluence with the Seneca river by a dam at Baldwinsville on the latter stream, elevation 374.0; above the movable dam at May's Point, elevation 380.0; and above dam at Barge canal lock No. 26, about 2.3 miles downstream from Clyde, elevation 386.0.

CLYDE RIVER AT LYONS

Gage No. 215

This station, located in the village of Lyons, was established September 27, 1905. A standard chain gage is attached to the downstream side of the Geneva street bridge and has a range of 14 feet, the zero of the gage being elevation 385.0 (B. C. datum). During the years 1907 to 1910, inclusive, discharge was obtained at this station, but at present it is maintained for water-surface elevations only.

The gage is read once daily — at 1 p. m. — to tenths.

This gage was replaced by new gage at lock No. 27 on June 30, 1919.

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 119

Daily elevation of water-surface (B. C. datum) of CLYDE RIVER AT GENEVA ST., LYONS, for the year ended June 30, 1919. R. D. Putnam and E. J. Weber, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	385.2	385.1	385.1	385.3	385.5	385.4	384.8	386.1	385.3	386.5	383.0	385.8
2.....	385.2	385.0	385.2	385.0	385.6	385.0	385.0	386.1	385.2	386.5	387.4	385.8
3.....	385.3	385.4	385.3	385.4	385.4	385.2	385.1	386.1	385.2	386.5	387.0	385.7
4.....	385.4	385.2	385.2	385.4	385.4	385.5	384.9	386.2	385.4	386.7	386.8	385.5
5.....	385.4	385.1	385.3	385.4	385.3	385.2	385.0	386.2	385.1	386.6	386.9	385.5
6.....	385.2	385.2	385.3	385.4	385.4	385.0	385.7	386.1	386.3	386.4	386.7	385.7
7.....	385.2	385.3	385.5	385.3	385.7	385.0	386.2	386.1	386.4	386.4	385.5	386.3
8.....	385.2	385.3	385.3	385.4	385.3	385.2	386.2	386.1	386.4	386.7	385.4	386.5
9.....	385.2	385.4	385.3	385.3	385.3	384.7	386.2	386.1	386.5	386.7	385.5	387.4
10.....	385.2	385.3	385.5	385.4	385.3	384.6	386.2	386.0	386.8	387.0	385.5	387.7
11.....	385.2	385.3	385.2	385.3	385.3	384.6	386.2	386.0	386.7	387.5	389.0	387.0
12.....	385.4	385.4	385.3	385.3	385.4	385.0	386.2	386.0	386.5	389.3	389.0	386.5
13.....	385.2	385.1	385.0	385.2	385.3	384.7	386.1	385.9	386.4	388.0	388.3	386.8
14.....	385.3	385.2	385.2	385.3	385.3	384.9	386.1	385.9	386.3	387.0	386.8	386.5
15.....	385.3	385.2	385.3	385.4	385.3	384.9	386.2	386.1	386.3	386.8	385.8	386.7
16.....	385.2	385.4	385.3	385.1	385.3	385.7	386.2	386.2	386.3	386.6	385.6	386.5
17.....	385.2	385.4	385.5	385.5	385.5	385.0	386.2	386.2	387.0	386.6	386.0	386.5
18.....	385.2	385.3	385.6	385.3	385.5	384.7	386.2	386.2	387.0	386.5	386.1	386.4
19.....	385.3	385.6	385.1	385.1	385.1	385.1	386.3	386.2	386.6	386.4	385.8	386.4
20.....	385.3	385.1	385.4	385.5	385.4	385.3	386.4	386.2	386.5	385.5	385.7	386.3
21.....	385.3	385.3	385.1	385.3	385.5	384.9	386.4	386.2	386.3	384.0	386.5	386.5
22.....	385.2	385.3	385.3	385.2	385.4	385.0	386.3	386.2	386.3	381.7	387.5	386.3
23.....	385.2	385.5	385.2	385.4	385.2	384.9	386.4	386.4	386.2	381.6	389.8	386.3
24.....	385.1	385.4	385.3	385.2	385.6	387.0	386.4	386.5	386.2	382.2	391.1	386.3
25.....	385.1	385.4	385.4	385.4	385.6	386.2	386.2	386.5	386.3	382.6	390.2	386.3
26.....	385.2	385.2	385.4	385.5	385.4	386.5	386.4	386.2	386.3	382.3	388.8	386.4
27.....	385.2	385.3	385.3	385.5	385.3	386.3	386.2	385.5	386.3	382.9	387.3	386.8
28.....	385.3	385.4	385.4	385.2	385.4	385.4	386.3	385.3	386.3	383.0	386.4	386.4
29.....	385.1	385.1	385.2	385.6	385.2	384.7	386.3	.....	386.3	383.0	386.9	386.6
30.....	385.4	385.4	385.3	385.5	385.3	384.6	386.3	.....	386.4	382.8	385.9	386.2
31.....	385.8	385.2	.....	385.6	.....	384.8	386.2	.....	386.4	.....	386.0	.....

NOTE.—This station discontinued June 30, 1919.

CLYDE RIVER AT CLYDE

Gage No. 214

This station is located in the village of Clyde; it was established October 20, 1905, as a discharge station, but on account of Barge canal construction, has been maintained since 1909 for water-surface elevations only. A standard chain gage, No. 214, was originally installed on the old Sodus street bridge and the datum was changed several times between April 1, 1916, and January 12, 1917, due to construction work and opening the gates of lock No. 26. On June 19, 1919, it was placed on the east side of the new viaduct near the north shore of the stream, about 400 feet downstream from the site of the old bridge. The gage has a range of 15 feet, between elevations 377.0 and 392.0. The gage

bench-mark, located on the top of pier No. 4, north shore, is at elevation 394.0, Barge canal datum.

The gage was read twice daily—at 7:30 A. M. and 5:30 to 6:30 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of CLYDE RIVER AT CLYDE, for the year ended June 30, 1919. H. K. Compson, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	384.24	384.44	384.29	384.44	384.54	384.34	383.84	385.29	384.59	385.69	381.89	384.49
2.....	384.29	384.29	384.29	384.34	384.64	384.24	383.99	385.29	384.29	385.64	385.99	384.44
3.....	384.24	384.44	384.34	384.49	384.49	384.19	384.04	385.24	384.29	385.69	385.94	384.49
4.....	384.29	384.34	384.39	384.44	384.54	384.49	383.59	385.29	384.59	385.74	385.89	384.34
5.....	384.39	384.29	384.49	384.44	384.49	384.24	384.74	385.29	384.39	385.69	385.74	384.44
6.....	384.24	384.34	384.34	384.29	384.59	384.59	385.29	385.24	385.44	385.49	384.54	384.99
7.....	384.39	384.39	384.54	384.39	384.69	384.24	385.19	385.24	385.54	385.49	384.44	385.54
8.....	384.24	384.54	384.64	384.39	384.34	384.19	385.29	385.19	385.59	385.79	384.39	385.59
9.....	384.29	384.64	384.44	384.49	384.44	383.79	385.29	385.09	385.74	385.84	384.39	385.99
10.....	384.29	384.54	384.49	384.19	384.54	383.59	385.19	385.14	385.84	385.89	384.54	386.09
11.....	384.49	384.39	384.54	384.44	384.49	383.69	385.29	385.19	385.69	386.24	386.14	385.59
12.....	384.49	384.44	384.59	384.39	384.44	384.04	385.19	385.09	385.59	386.74	386.44	385.49
13.....	384.44	384.39	384.34	384.39	384.39	383.94	385.24	384.99	385.39	385.89	385.79	385.59
14.....	384.39	384.39	384.44	384.39	384.44	383.74	385.34	384.99	385.39	385.74	384.84	385.39
15.....	384.39	384.34	384.44	384.39	384.34	383.79	385.24	385.29	385.49	385.54	384.54	385.44
16.....	384.24	384.34	384.54	384.14	384.44	383.99	385.34	385.34	385.49	385.49	384.49	385.39
17.....	384.24	384.29	384.59	384.39	384.54	383.79	385.39	385.29	385.89	385.49	384.89	385.54
18.....	384.24	384.39	384.44	384.49	384.64	383.84	385.39	385.39	385.84	385.54	384.44	385.39
19.....	384.44	384.59	384.24	384.24	384.39	384.04	385.44	385.29	385.64	385.39	384.54	385.39
20.....	384.34	384.09	384.44	384.59	384.34	383.94	385.39	385.29	385.39	384.49	384.49	386.00
21.....	384.54	384.34	384.24	384.44	384.59	383.89	385.49	385.29	385.39	382.19	384.99	386.25
22.....	384.24	384.34	384.34	384.24	384.49	383.84	385.49	385.34	385.39	380.59	385.49	386.05
23.....	384.34	384.54	384.49	384.54	384.39	383.94	386.49	385.49	385.29	380.34	386.74	386.10
24.....	384.44	384.59	384.39	384.34	384.54	384.99	385.59	385.54	385.49	380.74	387.79	386.10
25.....	384.39	384.54	384.44	384.44	384.44	385.44	385.49	385.54	385.49	381.09	387.29	386.10
26.....	384.14	384.59	384.34	384.39	384.44	385.54	385.54	385.19	385.39	380.94	386.44	386.15
27.....	384.29	384.44	384.49	384.49	384.34	385.39	385.44	384.54	385.39	381.14	385.19	386.45
28.....	384.44	384.49	384.44	384.49	384.34	384.54	385.39	384.39	385.49	381.24	385.19	386.15
29.....	384.29	384.39	384.44	384.69	384.34	383.54	385.49	.....	385.39	381.29	385.19	386.25
30.....	384.54	384.54	384.44	384.59	384.44	383.89	385.39	.....	385.59	381.04	384.59	386.15
31.....	384.34	384.49	.....	384.59	.....	383.89	385.39	.....	385.64	.....	384.54	.....

BARGE CANAL ABOVE LOCK No. 25, AT MAY'S POINT

Gage No. 403

A new station was established during March, 1918, below lock No. 25, at May's Point. A standard Type A gage, No. 403, is located on the northwest needle wall of the lock. It has a range of 12 feet, between elevations 376.0 and 388.0, and is read by an employee of the Department of Public Works. A bronze plug is set in the wall, alongside the gage, at elevation 387.0 (B. C. datum), the top of the lock wall being at elevation 388.0. The gage bench-mark is the one used for gage No. 404.

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 121

The gage was read twice daily—at 9 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL ABOVE LOCK No. 25, AT MAY'S POINT, for the year ended June 30, 1919. R. E. Fogarty, Observer

DAY	June	DAY	June	DAY	June
1.....		11.....	380.95	21.....	380.5
2.....		12.....	380.3	22.....	380.95
3.....		13.....	380.5	23.....	380.0
4.....		14.....	380.6	24.....	380.1
5.....		15.....	380.85	25.....	380.1
6.....		16.....	380.7	26.....	380.15
7.....		17.....	380.85	27.....	381.15
8.....	380.55	18.....	380.8	28.....	381.1
9.....	381.35	19.....	380.0	29.....	380.6
10.....	381.75	20.....	380.1	30.....	380.35

NOTE.— Readings begun June 8, 1919.

BARGE CANAL BELOW LOCK No. 25, AT MAY'S POINT

Gage No. 404

In March, 1918, a new station was established below lock No. 25, at May's Point. A standard Type A gage, No. 404, was placed on the east end of the north lock wall. It has a range of 12 feet, between elevations 369.0 and 381.0, and is read by an employee of the Department of Public Works. The gage benchmark, a square cut on the steps on the east side of the power-house, is at elevation 393.821 (B. C. datum). A bronze plug is set in the lock wall alongside the gage at elevation 380.0. The top of the wall is at elevation 381.0.

The gage was read twice daily—at 9 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) at BARGE CANAL BELOW LOCK No. 25, AT MAY'S POINT, for the year ended June 30, 1919. R. E. Fogarty, Observer

DAY	June	DAY	June	DAY	June
1.....		11.....	378.85	21.....	375.55
2.....		12.....	377.9	22.....	375.9
3.....		13.....	377.5	23.....	375.75
4.....		14.....	377.55	24.....	375.8
5.....		15.....	377.4	25.....	375.7
6.....		16.....	377.5	26.....	375.65
7.....		17.....	377.35	27.....	375.89
8.....	377.05	18.....	376.9	28.....	376.1
9.....	377.7	19.....	376.05	29.....	376.0
10.....	378.5	20.....	375.75	30.....	375.85

NOTE.— Readings begun June 8, 1919.

GANARGUA CREEK

DESCRIPTION

Ganargua creek proper, often called Mud creek, rises near Victor. Its course is northeasterly to Macedon, then easterly. The tributary drainage is of the characteristic glacial kame type and the tributaries are rather sparse, flowing oftentimes first north and then south between elongated hills, until they find their way to Ganargua creek. The principal tributary of Ganargua creek is Mud creek, which rises in the hilly region near the head of Canandaigua lake and flows northward about 20 miles, entering Ganargua creek at Victor.

Ganargua creek, approaching from the south, has been incorporated in the Barge canal from about the western limits of the town of Palmyra eastward for about $2\frac{3}{4}$ miles to a spillway 360 feet long, 160 feet of which is at canal pool elevation 430.0 and the remainder one foot higher, over which it passes to the north towards Harrison's mill. About 1.2 miles east of where the creek enters the canal there is a 5-ft. x 7-ft. gate to supply water to Barnhart's mill and from below this mill to the spillway portions of the original creek channel have been straightened. Ganargua creek reenters the Barge canal just west of the village of Lyons and above the dam at lock No. 27, immediately above its confluence with Canandaigua outlet, forming the Clyde river.

GANARGUA CREEK NEAR PALMYRA

Gage No. 217

This station, established March 25, 1907, is located at Harrison's mill about $2\frac{1}{2}$ miles east of Palmyra. The original gage, a staff fastened to the screen rack frame, was used until November 11, 1916, when a new standard gage, No. 217, was attached to the east wing wall of the south abutment of the highway bridge just above the mill. It has a range of 11 feet, between elevations 419.0 and 430.0. A standard bench-mark plug is set in the wing wall near the gage at elevation 428.0 (B. C. datum).

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 123

The gage was read twice daily to half-tenths and even hundredths.

Daily elevation of water-surface (B. C. datum) of GANARGUA CREEK NEAR PALMYRA, for the year ended June 30, 1919. C. H. Harrison, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	422.52	422.42	422.35	422.41	422.53	421.70	422.02	421.91	422.28	422.30	422.94	423.12
2	422.55	422.45	422.45	422.44	422.55	421.05	422.12	421.88	422.04	422.28	422.04	423.05
3	422.64	422.48	422.43	422.45	422.54	421.45	422.10	421.72	422.10	422.33	422.98	423.97
4	422.66	422.50	422.46	422.42	422.54	421.91	422.09	421.82	422.07	422.41	422.86	423.86
5	422.64	422.47	422.54	422.45	422.55	422.65	422.05	421.91	422.03	422.46	422.79	422.84
6	422.61	422.48	422.48	422.52	422.52	422.44	422.00	421.75	422.00	422.44	422.74	423.10
7	422.58	422.46	422.36	422.51	422.54	422.70	421.84	421.75	422.02	422.52	422.64	422.96
8	422.68	422.49	422.36	422.54	422.55	422.64	421.98	421.72	421.99	422.64	422.61	422.08
9	422.58	422.46	422.36	422.40	422.59	422.56	421.97	421.65	422.31	422.87	422.32	424.40
10	422.65	422.49	422.39	422.55	422.51	422.70	422.02	421.55	423.18	423.04	422.15	423.58
11	422.85	422.54	422.48	422.60	422.51	422.65	421.88	421.59	423.00	423.76	424.60	423.14
12	422.72	422.48	421.84	423.00	422.53	422.76	421.96	421.65	422.58	424.90	424.12	423.01
13	422.66	422.41	422.32	422.50	422.56	422.62	422.00	421.61	422.45	423.45	423.80	422.95
14	422.64	422.52	422.38	422.45	422.47	422.62	422.10	421.71	422.30	423.28	423.08	422.98
15	422.66	422.49	422.39	422.65	422.50	422.80	421.99	421.73	422.20	423.28	422.42	422.93
16	422.68	422.48	422.39	422.45	422.80	422.62	422.02	421.96	422.31	423.18	422.59	422.81
17	422.65	422.43	422.56	422.05	422.51	422.55	421.98	421.96	423.04	423.00	422.91	423.05
18	422.59	422.38	422.47	422.62	422.92	422.00	421.80	423.00	423.02	423.02	422.58	422.72
19	422.66	421.49	422.49	422.50	422.07	423.48	422.06	421.94	422.78	422.95	422.75	422.70
20	422.59	422.12	423.12	422.50	422.49	423.35	422.12	421.84	422.50	422.76	422.92	422.74
21	423.05	422.42	422.81	422.52	422.59	423.22	422.08	421.81	422.42	422.60	424.65	422.88
22	422.52	422.44	422.33	422.52	422.40	423.16	422.05	421.80	422.29	422.59	424.82	422.88
23	422.56	422.44	422.42	422.52	422.51	423.16	422.05	422.09	422.26	422.45	426.12	422.88
24	422.56	422.46	422.38	422.55	422.53	423.00	422.04	422.14	422.25	422.60	425.25	422.78
25	422.56	422.42	422.49	422.41	422.50	422.99	422.10	422.05	422.10	422.82	424.24	422.77
26	422.59	422.38	422.47	422.52	422.46	422.96	422.06	422.06	422.11	422.84	423.88	422.78
27	422.45	422.44	422.45	422.50	422.51	422.72	422.08	422.25	422.10	422.92	423.57	423.15
28	422.52	422.44	422.43	422.58	422.49	422.50	422.00	421.99	422.10	422.07	423.53	423.00
29	422.49	422.44	422.43	422.53	422.49	422.15	421.92	.....	422.12	423.09	423.28	422.85
30	422.49	422.72	422.40	422.49	422.45	422.14	421.95	.....	422.25	423.03	423.40	422.78
31	422.49	422.26	.....	422.50	.....	422.00	421.90	.....	422.40	.....	423.09	.....

CANANDAIGUA OUTLET

DESCRIPTION

Canandaigua lake occupies one of the elongated depressions extending in nearly a north and south direction in the central lake region of New York. The drainage tributary to the lake is chiefly short lateral streams from the steep slopes of adjacent hill-sides. The outflow from the lake is regulated to some extent by gates. The lake is at elevation about 686. From the foot of the lake at Canandaigua the outlet flows northward to Manchester, a distance of 7 miles. In this distance a fall of 100 feet occurs,

which is chiefly concentrated at several water-power dams. From Manchester the stream flows easterly 12 miles and thence north-easterly 8 miles, joining Ganargua creek at Lyons to form the Clyde river. In the easterly portion of its course the stream winds with large bends through a broad sloping valley of fertile land. The fall is mostly utilized at water-power dams. The tributary drainage is moderately rolling and is interspersed with glacial kames. These are lenticular hills extending usually in a north and south direction. At Phelps, Flint creek, which is the largest tributary, enters the outlet. Flint creek drains a valley similar to the adjacent lake basins. This valley is not at present occupied by a lake, but contains an extensive swamp, reaching several miles southward from Gorham.

CANANDAIGUA OUTLET AT ALLOWAY

Gage No. 216

Location.—At a highway bridge crossing the stream in the village of Alloway about $2\frac{1}{2}$ miles upstream, or south of Lyons.

Drainage area.—440 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—September 18, 1906, to June 30, 1919.

Gage.—The original staff gage was replaced on November 7, 1916, by a standard Type A gage secured to the north wing of the west abutment of the highway bridge and has a range of $11\frac{1}{2}$ feet, between elevations 402.5 and 414.0. A standard benchmark plug is set near the gage at elevation 410.0 (B. C. datum). The gage is read twice daily—between 7 and 8 A. M. and 4 and 7 P. M.—to half-tenths.

Discharge measurements.—Current-meter measurements made from the highway bridge, which has a span of 95 feet.

Control.—Except during low stages the control at this station is Slaters dam, located about two miles below the bridge, together with the slope upstream. Sluice-gates at the dam are kept open always, water passing over the crest only during extremely high flows.

Extremes of discharge.—1906-1918: Maximum stage recorded, March 29, 1916, at 8:30 A. M., elevation 412.5; discharge estimated as 3,870 second-feet. Minimum stage recorded, elevation 403.0 on December 24, 1916, at 4:20 P. M.; discharge, estimated at 2 second-feet.

Regulation.—Daily flow materially affected by operation of grist-mill a quarter mile above station.

Accuracy.—Discharge rating curve fairly well defined for flows below 1,000 second-feet. Higher flows estimated.

Daily elevation of water-surface (B. C. datum) of CANANDAIGUA OUTLET AT ALLOWAY, for the year ended June 30, 1919. Carl Tuscher, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	404.60	404.50	403.85	.....	.....	404.20	404.40	404.22	404.50	404.40	405.60	406.88
2	404.60	404.50	403.85	.....	.....	404.18	404.40	404.20	404.10	404.40	405.62	406.50
3	404.42	404.50	.....	.....	.....	404.25	404.40	404.22	404.10	404.42	405.52	406.25
4	404.75	404.50	.....	.....	.....	404.30	404.40	404.25	404.10	404.40	405.40	406.08
5	404.60	404.50	.....	.....	.....	404.95	404.40	404.22	404.10	404.50	405.50	405.78
6	404.42	404.30	.....	.....	404.38	404.10	404.40	404.20	404.48	404.55	405.52	405.62
7	404.40	404.28	.....	.....	404.70	403.80	404.40	404.20	404.12	405.02	405.50	405.65
8	404.30	404.30	.....	.....	404.40	404.10	404.40	404.12	404.10	405.12	405.35	405.42
9	404.30	404.30	.....	.....	404.40	404.60	404.32	404.10	404.60	405.10	405.22	407.75
10	404.20	404.30	.....	.....	404.10	404.30	404.20	404.10	405.55	405.92	406.20	406.82
11	404.45	404.30	.....	.....	404.10	404.48	404.12	404.10	405.05	407.58	410.90	406.20
12	404.32	404.30	.....	.....	404.10	404.60	404.10	404.10	404.75	409.35	408.45	406.00
13	404.30	404.30	.....	.....	404.10	404.60	404.10	404.00	404.60	406.95	408.40	405.90
14	404.40	404.15	.....	.....	404.10	405.12	404.10	404.30	404.40	406.65	407.65	405.78
15	404.30	404.40	.....	.....	404.05	405.00	404.10	404.32	404.30	406.40	407.50	405.85
16	404.28	404.30	.....	.....	404.06	404.90	404.18	404.15	404.60	406.32	407.00	405.92
17	404.22	404.30	.....	.....	404.00	404.70	404.28	404.15	406.58	406.15	406.85	405.95
18	404.20	404.30	.....	.....	404.45	404.60	404.32	404.15	405.90	406.00	406.88	405.80
19	404.20	404.30	.....	.....	404.60	404.60	404.40	404.15	405.30	405.60	406.60	405.90
20	404.30	404.30	.....	.....	404.40	404.60	404.40	404.12	405.05	405.40	406.52	405.78
21	404.30	404.30	.....	.....	404.40	404.45	404.40	404.15	405.00	405.30	407.55	405.80
22	404.30	404.25	.....	.....	404.60	404.50	404.40	404.18	405.00	405.30	408.50	405.80
23	404.40	404.20	.....	.....	404.30	404.70	404.30	404.40	405.00	404.90	409.80	405.72
24	404.40	404.20	.....	.....	404.30	404.70	404.30	404.35	404.75	405.05	410.05	405.72
25	404.05	404.15	.....	.....	404.32	404.70	404.30	404.30	404.72	405.58	409.72	405.62
26	404.50	404.00	.....	.....	404.42	404.65	404.30	404.30	404.70	405.62	408.40	405.60
27	404.30	404.00	.....	.....	404.30	404.40	404.30	404.40	404.62	405.90	408.30	406.55
28	404.25	404.00	.....	.....	404.30	404.40	404.35	404.35	404.70	405.82	407.85	406.40
29	404.72	404.00	.....	.....	404.10	404.40	404.35	.....	404.58	405.75	407.20	406.40
30	404.62	404.00	.....	.....	404.20	404.40	404.30	.....	404.42	405.62	407.12	405.60
31	404.50	404.00	.....	.....	.....	404.40	404.20	.....	404.45	.....	407.10	.....

NOTE.—Elevations from September 3 to November 5 doubtful.

Water-surface elevations are means of two readings daily.

OWASCO OUTLET

DESCRIPTION

Owasco lake is one of the finger lake group in central New York and is generally rated as the sixth in size. It is about 11 miles long and has a maximum width of 1.25 miles. It has a water-surface area of approximately 10.4 square miles and is drained by Owasco outlet.

The lake extends in a north and south direction and lies wholly within the boundaries of Cayuga county. The southern half of the lake, on both the east and west sides, is flanked by steep, sloping hills, rising to elevations of 500 to 800 feet above the lake surface, which is at an elevation of 710 feet above tide-water. These hills are rather deeply indented by numerous small streams that enter the lake at almost right angles from either side. To the south of the head of the lake and extending for some 17 or 18 miles is a rather narrow valley, the floor of which is about one-half mile wide at the lake and narrows as it approaches the southern extremity. This valley is drained by Owasco inlet, which rises near Freeville in Tompkins county.

The dividing line for the drainage basin is at an elevation of from 700 to 1,300 feet above sea-level on the west and attains an altitude of some 1,600 feet on the east. The western line falls about 2 miles back from the lake; the eastern divide extends some 7 or 8 miles. The general shape of the drainage basin is long and narrow, the northern end terminating on the shores of Seneca river, into which the waters drain.

Owasco lake occupies about the center of the drainage basin north and south. Northward from the foot of the lake the descent is very rapid, there being 325 feet fall in the 17 miles between the outlet and Seneca river. One hundred and ten feet of this fall is practically within the city limits of Auburn and is utilized by the numerous manufacturing interests in that city. From a point just above Throopsville to Port Byron, a distance of about 5 miles, there is a fall of 130 feet, very little of which is developed. A State dam about one mile below the outlet of the lake practically controls the low and medium flow of this drainage basin. The drainage area is representative of the farming district in central New York and is fairly well timbered.

OWASCO OUTLET NEAR AUBURN

Location.—On the farm of Charles H. Pearce, 2 miles below the center of the city of Auburn, Cayuga county, and $3\frac{3}{4}$ miles below the State dam at the outlet of Owasco lake.

Drainage area.—206 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—November 17, 1912, to June 30, 1919.

Gage.—Gurley water-stage recorder in a concrete shelter on the left bank on the farm of Charles H. Pearce; inspected by Charles H. Pearce.

Discharge measurements.—Made by wading directly opposite the gage in low water and from a cable at the same section in high water.

Channel and control.—A low concrete control has been constructed about 15 feet below the gage. Crest of control is 1 foot wide and the slopes of both upstream and downstream faces are 1 on 2. A small horizontal apron built on a level with the bed of the stream extends downstream $2\frac{1}{2}$ feet from toe of dam. Mean elevation of the left end of the dam for a distance of 50 feet is at gage height 1.28 feet; the remaining 50 feet of the crest of the dam is at gage height 2.13 feet.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 3.55 feet at 9 A. M., April 12; discharge, 1,150 second-feet. Minimum stage from water-stage recorder, 1.63 feet at 1 A. M., September 7; discharge, 33 second-feet.

1912-1919: Maximum stage, 6.4 feet during period March 25 to 30, 1913, determined by leveling from flood-marks; discharge, 2,750 second-feet. Minimum stage from water-stage recorder, 1.41 at 1 A. M., October 15, 1915; discharge, 5.6 second-feet.

Ice.—Stage-discharge relation seldom affected by ice.

Diversions.—An average flow of about 10 second-feet is pumped from Owasco lake for the municipal water-supply of the city of Auburn. Proportion returning to stream above the gaging station is not known.

Regulation.—Large diurnal fluctuation in flow during low-water periods, due to mills in the city of Auburn; seasonal flow regulated at the State dam at the outlet of Owasco lake.

Accuracy.—Stage-discharge relation permanent; not affected by ice during year. Rating curve well defined between 1 and

1,700 second-feet. Operation of the water-stage recorder fairly satisfactory during periods when it was in operation. Daily discharge ascertained by averaging the hourly discharge. Records excellent, except for periods of no gage-height records.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurement of OWASCO OUTLET NEAR AUBURN, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 11.....	E. D. Burchard.....	2.43	254

Daily discharge, in second-feet, of OWASCO OUTLET NEAR AUBURN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	206	194	134	129	150	139	360	201	201	374	559	280
2.....	206	205	149	123	150	156	368	189	171	384	582	280
3.....	206	195	157	125	150	157	383	193	196	394	539	230
4.....	206	186	156	141	150	154	372	186	187	390	528	220
5.....	206	191	159	145	150	151	383	190	192	445	544	210
6.....	206	205	147	106	150	152	388	190	191	519	456	200
7.....	206	204	141	144	150	150	384	190	208	688	381	190
8.....	206	209	132	138	150	146	371	187	196	663	367	180
9.....	206	198	149	136	150	154	368	185	204	641	375	180
10.....	206	190	150	131	150	154	377	209	214	698	461	190
11.....	188	185	145	131	150	150	371	199	217	881	689	200
12.....	168	180	155	113	150	142	373	194	219	1,000	772	200
13.....	168	180	177	71	150	152	377	194	221	925	826	200
14.....	160	180	183	134	150	189	336	190	223	941	776	208
15.....	168	176	96	142	150	174	290	190	228	908	738	194
16.....	171	194	137	146	150	172	292	198	276	897	728	193
17.....	162	168	181	139	150	169	259	209	380	864	749	181
18.....	161	185	167	143	150	170	263	200	390	799	725	181
19.....	165	175	159	154	150	173	243	181	390	738	709	171
20.....	171	177	188	98	150	168	236	98	398	702	700	163
21.....	181	175	169	96	150	167	223	192	392	649	650	206
22.....	191	183	77	141	150	177	234	192	386	620	540	171
23.....	178	179	124	162	165	209	230	181	378	580	700	175
24.....	184	163	80	167	147	236	238	193	382	550	720	189
25.....	185	174	137	153	161	234	237	198	375	540	728	165
26.....	190	175	134	136	168	292	218	194	368	520	743	197
27.....	190	173	126	101	155	374	210	193	368	508	591	133
28.....	190	167	116	162	142	379	200	194	371	500	451	178
29.....	190	167	92	171	151	364	195	.....	379	492	370	185
30.....	195	162	138	103	149	376	189	.....	380	493	330	176
31.....	195	172	.....	140	.....	365	194	.....	389	.....	300	.....
Mean..	187	182	142	136	151	205	296	190	203	643	590	193

NOTE.—Mean discharge, July 1 to 10, estimated, 206 second-feet, and November 1 to 28, 150 second-feet. Discharge estimated, October 31, January 27 and 28, February 5 to 7 and 14 and 15, April 22 to 26, May 20 to 24 and 29 to 31 and June 1 to 13, from precipitation and temperature record and observer's weekly readings of gage height.

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 129

Monthly discharge of OWASCO OUTLET NEAR AUBURN, for the year ended June 30, 1919
[Drainage area, 208 square miles.]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July .....	.....	160	187	0.908	1.08
August	209	162	182	0.883	1.02
September	188	77	142	0.689	0.77
October	193	71	136	0.660	0.76
November .....	.....	.....	151	0.733	0.82
December	379	139	208	0.995	1.15
January	388	189	296	1.44	1.66
February	209	96	190	0.922	0.96
March	398	171	293	1.42	1.64
April	1,000	374	643	3.12	3.48
May	826	a 300	590	2.86	3.30
June	a 280	133	193	0.937	1.06
The year	1,000	71	267	1.30	17.68

a Estimated.

ONONDAGA LAKE

DESCRIPTION

Onondaga lake, situated north of the city of Syracuse, is about 4½ miles long, having an average width of 1 mile and a surface area of 4.7 square miles. The surface elevation is about 365, Barge canal datum, and has an average annual range of nearly 6 feet.

The drainage area, including the lake surface, is about 288 square miles, lying mostly to the south and southwest. Included in this area is Otisco lake with a water-surface of 3.3 square miles, discharging through Nine-Mile creek, and a group of small lakes drained by Onondaga creek. Besides these principal tributaries there are a few small streams entering the lake from the north and east.

Onondaga lake discharges into the Seneca river through Onondaga outlet, which is canalized as a part of the Barge canal system. A low navigable stage at elevation 363.0 will be maintained on this lake by the dam on the Oswego river at Phoenix.

ONONDAGA LAKE AT SYRACUSE

Gage No. 213

This station is located at the head, or south end of Onondaga lake. Until October 1, 1916, the water-surface was obtained by measuring down from a reference point on the west abutment of the New York Central railroad bridge over Onondaga creek. Since that date the reference point has been located at the new New York Central railroad bridge over the terminal channel at Syracuse, being on the top of the pier on the east side of the channel at the angle in the pier near the north girder of the bridge.

The gage is read once daily — about noon — to tenths.

Daily elevation of water-surface (B. C. datum) of ONONDAGA LAKE AT SYRACUSE,
for the year ended June 30, 1919. R. D. Smith, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.8	363.8	a	364.2	364.3	a	a	364.1	364.2	365.0	365.5	a
2.....	363.8	363.7	a	364.1	364.3	363.9	364.2	a	a	364.9	365.6	365.6
3.....	363.7	363.6	363.5	364.1	a	363.9	364.2	364.0	364.4	364.9	365.4	365.2
4.....	a	a	363.5	364.1	364.3	363.9	364.2	364.1	364.4	365.0	a	364.6
5.....	363.9	363.8	363.4	364.1	a	363.8	a	364.0	364.7	365.3	365.2	364.4
6.....	363.8	363.7	363.5	a	364.2	364.1	364.2	364.1	364.4	a	365.2	364.1
7.....	363.7	363.7	363.3	364.2	364.1	363.9	364.1	364.3	364.4	365.2	365.1	364.2
8.....	363.6	363.6	363.4	364.3	364.0	a	364.0	363.3	364.3	365.2	365.0	a
9.....	363.8	363.7	363.5	364.2	364.0	363.9	364.1	a	a	365.3	364.8	364.9
10.....	363.9	363.8	363.3	364.1	364.0	364.1	364.0	364.1	365.1	365.3	364.9	364.7
11.....	a	a	363.3	364.0	363.9	364.1	363.9	364.0	365.3	365.5	a	364.9
12.....	364.0	364.0	363.3	a	364.0	363.9	a	364.0	365.1	366.2	365.7	364.9
13.....	363.8	363.7	363.6	a	363.9	364.1	364.4	363.9	365.0	a	366.1	364.7
14.....	a	363.6	363.4	364.2	363.8	364.3	364.4	364.2	364.8	366.7	366.2	364.5
15.....	363.9	363.6	a	363.9	364.1	a	364.3	364.2	364.7	366.4	365.9	a
16.....	363.8	363.6	363.8	363.9	364.1	364.4	364.2	a	a	366.9	365.5	364.5
17.....	363.8	363.5	363.7	363.9	a	364.3	364.2	364.1	364.8	365.7	365.3	364.5
18.....	363.8	a	363.8	363.9	364.3	a	364.1	364.1	365.1	365.4	a	364.5
19.....	363.7	363.5	363.8	363.9	364.4	363.9	a	364.0	365.4	365.2	365.3	364.3
20.....	363.8	363.5	363.9	a	364.3	364.1	364.2	363.9	365.4	a	365.3	364.0
21.....	a	363.5	364.2	364.1	364.3	364.1	364.1	363.8	365.4	365.1	365.2	364.0
22.....	364.0	363.5	a	363.9	364.1	a	364.1	363.7	365.2	365.2	365.3	a
23.....	363.8	363.4	364.2	363.9	364.1	364.2	364.1	a	a	365.2	365.8	364.0
24.....	363.8	363.3	364.1	363.9	a	364.3	364.6	364.2	364.9	365.2	366.2	364.1
25.....	363.9	a	364.1	363.9	363.9	a	364.4	364.2	364.9	365.2	a	364.0
26.....	363.9	363.5	363.9	364.1	363.9	364.5	a	364.3	364.8	365.2	366.6	363.9
27.....	363.9	363.4	364.1	a	364.1	364.3	364.3	364.2	364.8	a	366.6	363.9
28.....	a	363.4	364.4	363.9	a	364.2	364.2	364.1	365.0	365.2	366.3	364.0
29.....	364.0	363.4	a	364.1	363.9	a	364.2	.....	365.0	365.5	366.0	a
30.....	363.9	a	364.2	364.1	363.9	364.1	364.1	.....	a	365.0	365.7	364.0
31.....	363.9	363.3	.....	364.3	.....	363.9	364.2	.....	364.9	.....	365.6	.....

a No record.

ONONDAGA OUTLET AT LONG BRANCH

Gage No. 212

New gage No. 212, a standard Type A gage, was established December 19, 1917, at the Long Branch boat-house on Onondaga lake outlet, on the southeast, or upstream, corner of the building. It has a range of 8 feet, between elevations 363.0 and 371.0. The gage bench-mark is a nail in the root of a maple tree west of trolley tracks, west approach to Outlet bridge, at elevation 374.21 (B. C. datum). This gage supersedes old No. 212, of the same title, discontinued September 30, 1917, and also No. 197, formerly published as "Seneca River at Mud Lock, near Long Branch," discontinued October 31, 1917.

It is read twice daily—at 8 A. M. and 5 P. M.—to half-tenths.

Daily elevation of water-surface (B. C. datum) of ONONDAGA OUTLET AT LONG BRANCH, for the year ended June 30, 1919. Marcus A. Smith, Observer

DAT	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	363.85	363.82	363.38	364.20	364.35	363.85	363.90	364.00	364.10	364.90	365.50	365.70
2	363.65	363.72	363.58	364.12	364.22	364.10	364.10	364.00	364.30	364.85	365.60	365.60
3	363.75	363.72	363.58	364.12	364.32	364.02	364.20	364.00	364.45	364.90	365.40	365.10
4	363.82	363.72	363.60	364.10	364.38	363.92	364.20	364.10	364.40	365.10	365.20	364.60
5	363.90	363.88	363.55	364.15	364.25	363.88	364.10	364.10	364.50	365.30	365.20	364.40
6	363.80	363.80	363.48	364.20	364.20	363.92	364.10	364.10	364.40	365.20	365.15	364.20
7	363.80	363.72	363.45	364.38	364.12	363.92	364.00	364.30	364.35	365.15	365.10	364.30
8	363.65	363.72	363.48	364.38	364.08	363.88	364.00	364.30	364.30	365.10	364.95	364.50
9	363.65	363.80	363.68	364.22	364.02	364.05	364.05	364.10	364.50	365.30	364.80	364.60
10	363.75	363.78	363.58	364.12	363.95	364.08	364.10	364.10	365.05	365.40	365.00	364.75
11	363.92	363.85	363.58	364.10	363.95	364.00	364.10	364.00	365.20	365.60	365.40	364.95
12	363.95	364.00	363.62	364.22	364.08	363.88	364.30	363.95	365.10	366.30	365.80	364.90
13	363.92	363.82	363.72	364.20	363.92	364.08	364.40	364.00	364.90	366.75	366.15	364.70
14	363.90	363.78	363.72	364.15	363.92	364.25	364.35	364.15	364.80	366.70	366.20	364.50
15	363.88	363.68	363.82	364.08	364.12	364.35	364.30	364.10	364.65	366.40	365.90	364.50
16	363.90	363.60	363.90	364.02	364.18	364.40	364.20	364.10	364.55	366.50	365.50	364.50
17	363.92	363.52	363.98	364.05	364.18	364.32	364.20	364.10	364.80	366.65	365.25	364.60
18	363.88	363.65	363.95	363.98	364.32	364.22	364.15	364.00	365.15	365.40	365.30	364.60
19	363.85	363.78	364.05	363.98	364.42	364.12	364.20	364.00	365.40	365.20	365.25	364.30
20	363.80	363.68	364.28	364.02	364.35	364.02	364.20	363.90	365.40	365.10	365.30	364.10
21	363.95	363.58	364.22	364.10	364.15	364.02	364.10	363.80	365.30	365.15	365.25	364.00
22	364.02	363.58	364.22	364.00	364.08	364.05	364.10	363.70	365.10	365.25	365.30	363.90
23	363.90	363.50	364.28	364.02	364.05	364.15	364.15	363.80	365.00	365.20	365.85	364.05
24	363.98	363.42	364.22	364.02	363.95	364.28	364.50	364.15	364.90	365.20	366.25	364.10
25	363.90	363.40	364.18	364.00	363.92	364.38	364.30	364.20	364.90	365.20	366.50	364.10
26	363.98	363.58	364.22	364.12	363.90	364.42	364.25	364.30	364.80	365.20	366.60	364.00
27	363.98	363.52	364.38	364.20	363.98	364.38	364.25	364.20	364.80	365.25	366.60	364.00
28	363.95	363.58	364.38	364.15	363.92	364.25	364.20	364.10	364.75	365.30	366.35	364.05
29	364.10	363.35	364.28	364.10	363.92	364.05	364.20	.....	364.80	365.50	365.95	364.10
30	364.02	363.35	364.20	364.18	363.82	364.08	364.10	.....	364.80	365.50	365.80	364.05
31	363.95	363.30	.....	364.38	.....	363.95	364.10	.....	364.90	.....	365.70	.....

ONEIDA RIVER BASIN

DESCRIPTION

The territory drained by the Oneida river is, in shape, roughly a square of about 40 miles on the side, lying west of the upper portion of the Mohawk drainage basin. From its northeast corner a peninsula-like area of about 80 square miles, drained by the upper portion of East branch, Fish creek, projects northward between the Salmon and Black river drainage areas.

The total drainage area is 1,493 square miles, of which the run-off from 1,353 square miles, or slightly over 90 per cent, passes through Oneida lake, which has a water-surface of 78 square miles, or $5\frac{3}{4}$ per cent of the area above its outlet, and an annual range of surface of about 3 to 6 feet, which together with the dam and gate at Caughdenoy offers facilities for considerable regulation of the flow in the Oneida river.

There is a small amount of local storage for and diversion to the old Erie canal in the southern portion of this basin. Water is also diverted into this drainage area from the Black and Mohawk basins through the summit levels of the old Erie and new Barge canals.

The overflow from this basin through the Oneida river unites with that of the Seneca river at Three River Point to form the Oswego river.

For table of areas of this drainage basin see page 73.

ONEIDA RIVER

The Oneida river is a winding stream about $17\frac{3}{4}$ miles long, extending from Brewerton at the outlet of Oneida lake to Three River Point, where it unites with the Seneca to form the Oswego river.

The Oneida river has been canalized in connection with the construction of the Barge canal. Two large and two smaller bends have been cut off, but on the largest cut-off, that opposite the new Caughdenoy dam, is located Barge canal lock No. 23 and

normally only that portion of the flow of the river required for canal purposes at the lock passes through this channel.

About 4 miles below Brewerton and about $2\frac{1}{2}$ miles below the east end of the Caughdenoy cut-off and about 600 feet above the old lock and highway bridge, a dam has been constructed to retain a low navigable surface in Oneida lake and above lock No. 23 at elevation 369.9. This dam is a concrete structure with a straight ogee type crest 415 feet long at elevation 369.63. In the old canal lock a vertical lift-gate has been constructed with a clear span of 30 feet 9 inches and sill at elevation 362.73. The dam was completed in the summer of 1909, and the gate, January 1, 1914.

Below lock No. 23 a low navigable surface is maintained at elevation 363.0 by the dam on the Oswego river at Phoenix.

Occasional apparent inconsistencies in the tables of water-surface elevation, where the water-level at an upstream gage is recorded slightly lower than at a point farther downstream, are, as a rule, not the result of actual mistakes, but arise from the fact that most of the gages are read to the nearest tenth of a foot only, and also from the fact that streams and lakes are sometimes affected by wind to such an extent as to cause the water-surface to be slightly higher at the downstream end of a level reach than at the upstream end.

ONEIDA RIVER AT BREWERTON

Gage No. 185

This station is located on the Oneida river at Brewerton about 1,500 feet downstream from Oneida lake and indicates lake surface very closely. It was established April 22, 1904, to determine water-surface elevations only. The staff gage on the downstream side of the New York State boat-house was superseded on July 21, 1916, by a standard Type A gage. This gage, No. 185, is secured to the east end of the concrete dock below the Brewerton highway bridge and has a range of 8 feet, between elevations 368.0 and 376.0. The gage bench-mark is a square chisel cut, in top of concrete dock wall about 3 feet from the end and is at elevation 375.372 (B. C. datum).

The gage is read once daily — A. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER AT BREWERTON,
for the year ended June 30, 1919. A. R. Merritt, Observer

DAY	July	Aug.	Se. t.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	370.5	370.45	370.2	371.0	371.2	370.75	371.15	371.15	370.85	371.9	372.25	372.0
2.	370.5	370.45	370.15	371.0	371.3	370.7	371.15	371.1	370.9	371.9	372.2	371.95
3.	370.5	370.45	370.15	371.0	371.3	370.6	371.2	371.1	371.0	371.9	372.25	371.8
4.	370.5	370.4	370.2	371.0	371.25	370.45	371.25	371.1	371.15	371.95	372.2	371.75
5.	370.45	370.35	370.2	371.0	371.4	370.45	371.25	371.05	371.15	371.95	372.2	371.7
6.	370.45	370.35	370.2	371.5	371.35	370.4	371.3	371.05	371.2	372.0	372.25	371.6
7.	370.4	370.4	370.15	371.5	371.3	370.4	371.3	371.0	371.25	372.1	372.3	371.5
8.	370.4	370.45	370.2	371.1	371.25	370.4	371.3	371.0	371.3	372.2	372.15	371.4
9.	370.35	370.5	370.2	371.15	371.2	370.35	371.3	370.95	371.4	372.2	372.2	371.3
10.	370.4	370.5	370.2	371.1	371.2	370.4	371.25	370.95	371.5	372.2	372.25	371.25
11.	370.45	370.	370.15	371.05	371.15	370.4	371.2	370.9	371.6	372.55	372.3	371.2
12.	370.5	370.5	370.1	371.0	371.1	370.45	371.2	370.85	371.7	372.8	372.2	371.3
13.	370.5	370.5	370.15	370.95	371.0	370.5	371.15	370.9	371.8	372.95	372.25	371.15
14.	370.55	370.45	370.15	370.9	370.9	370.55	371.1	370.9	371.8	373.1	372.25	371.1
15.	370.6	370.4	370.2	370.8	370.85	370.7	371.1	370.9	371.8	373.1	372.2	371.1
16.	370.6	370.4	370.25	370.8	370.8	370.8	371.1	370.9	371.8	373.5	372.2	371.1
17.	370.6	370.4	370.3	370.7	370.8	370.9	371.05	370.9	371.9	372.9	372.25	371.1
18.	370.65	370.35	370.4	370.7	370.85	371.0	371.0	370.9	371.95	372.85	372.3	371.0
19.	370.7	370.3	370.5	370.65	370.85	370.95	371.0	370.9	372.0	372.8	372.35	371.0
20.	370.7	370.3	370.6	370.6	370.8	370.9	371.0	370.9	372.0	372.75	372.4	370.9
21.	370.7	370.25	370.75	370.6	370.8	370.9	370.95	370.85	372.05	372.7	372.35	370.9
22.	370.7	370.2	370.9	370.6	370.75	370.9	370.9	370.85	372.0	372.6	372.4	370.9
23.	370.7	370.25	370.95	370.65	370.75	370.9	371.0	370.8	372.0	372.5	372.4	370.85
24.	370.65	370.3	370.95	370.65	370.75	371.0	371.05	370.8	372.05	372.15	372.4	370.85
25.	370.65	370.3	371.0	370.7	370.75	371.15	371.1	370.8	372.1	372.3	372.4	370.8
26.	370.65	370.3	371.0	370.8	370.7	371.3	371.15	370.8	372.05	372.15	372.45	370.8
27.	370.6	370.25	371.1	370.9	370.75	371.3	371.2	370.85	372.0	372.2	372.4	370.75
28.	370.6	370.25	371.1	371.0	370.8	371.25	371.2	370.85	372.0	372.3	372.35	370.75
29.	370.55	370.25	371.1	371.0	370.7	371.1	371.2	.....	372.0	372.15	372.3	370.7
30.	370.55	370.2	371.15	371.0	370.75	371.1	371.2	.....	372.0	372.15	372.2	370.7
31.	370.5	370.2	.....	371.15	.....	371.1	371.15	.....	371.95	.....	372.1	.....

ONEIDA RIVER AT LOCK No. 23, NEAR BREWERTON

Gages Nos. 405 and 406

A new station, gage No. 405, was established on December 6, 1917, above lock No. 23, about $2\frac{1}{2}$ miles west of the village of Brewerton. A standard staff gage, graduated to feet and tenths, is located on the upper north approach wall of the lock, just above the gate recess. It has a range of eight feet, between elevations 368.0 and 376.0.

A new station, gage No. 406, was also established December 6, 1917, below lock No. 23. A standard staff gage, graduated to feet and tenths, was placed on the return wall, just west of the power-house. It has a range of eight feet, between elevations 362.0 and 370.0 (B. C. datum).

The gages were read twice daily—about 6 A. M. and 6 P. M.—to tenths.

The bench-mark for both gages is a brass plug set in the south wall of the lock near the third snubbing post east of west gates at elevation 377.067 (B. C. datum).

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER ABOVE LOCK No. 23, NEAR BREWERTON, for the year ended June 30, 1919. Wm. M. Persing, Observer

DAY	June	DAY	June	DAY	June
16.....		21.....	370.8	26.....	370.8
17.....	370.8	22.....	370.8	27.....	370.7
18.....	370.85	23.....	370.75	28.....	370.65
19.....	370.85	24.....	370.7	29.....	370.7
20.....	370.85	25.....	370.75	30.....	370.6

NOTE.—Readings begun June 17, 1919.

Daily elevations of water-surface (B. C. datum) of ONEIDA RIVER BELOW LOCK No. 23, NEAR BREWERTON, for the year ended June 30, 1919. Wm. M. Persing, Observer

DAY	JUNE	DAY	June	DAY	June
16.....		21.....	363.85	26.....	363.9
17.....	364.1	22.....	363.85	27.....	363.8
18.....	364.02	23.....	363.9	28.....	363.9
19.....	364.05	24.....	364.05	29.....	364.0
20.....	363.95	25.....	363.95	30.....	363.9

NOTE.—Readings begun June 17, 1919.

ONEIDA RIVER AT CAUGHDENROY

Gages Nos. 183 and 184

Location.—At the Caughdenroy dam on the Oneida river about 600 feet above the highway bridge at Caughdenroy and about 4 miles below Oneida lake.

Drainage area.—1,377 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Water-surface elevations, April 22, 1904, to June 30, 1919. Discharge, January 1; 1910, to June 30, 1918. Dam completed during summer of 1909.

Gages.—Upper gage: On July 20, 1916, the staff on tree on right bank about 50 feet above dam was superseded by a standard Type A gage, No. 184, and by a slope gage on the bank. The standard gage is secured to the same tree and has a range of 8 feet, between elevations 366.0 and 374.0. The slope gage on the bank a short distance upstream has a range of 5 feet, between elevations 372.0 and 377.0. The gage bench-mark is a nail in last tree in row on north side of highway opposite northeast monument and is at elevation of 389.424 (B. C. datum).

Lower gage: On July 19, 1916, the staff gage on pile below old lock was superseded by a standard Type A gage. This gage, No. 183, is secured to the west end of concrete retaining wall below lower south approach wall to Caughdenroy lock, and has a range of 12 feet, between elevations 362.0 and 374.0. A standard bench-mark plug is set in the face of the wall near the gage at elevation 368.0 (B. C. datum).

These gages are read once daily—about 11 A. M.—the upper one to half-tenths, the lower one to tenths.

Discharge computations.—Flow over dam computed, using coefficient derived from U. S. Geological Survey experiments, submergence from U. S. Deep Waterways experiments. Flow through gate and diversion through lock culverts estimated by theoretical calculations.

Control.—Concrete dam with straight ogee type crest 415 feet long at elevation 369.63 and a vertical lift-gate with clear span of 30 feet 9 inches and sill at elevation 362.73.

Extremes of discharge.—1910–1919: Maximum discharge recorded, March 30, 1913, 11,100 second-feet. Minimum discharge recorded, January 9, and March 13 and 14, 1914, zero

second-feet, water below crest of dam and no reported diversion.

Diversion.—From the southern portion of this drainage basin, principally on Chittenango, Butternut, Oneida and Limestone creeks, there is storage and diversion for the water-supply of the old Erie canal. From the Black and Mohawk river basins there is diversion into this drainage area via the summit levels of the old Erie and new Barge canal.

Regulation.—By storage indicated under diversion and by Oneida lake surface of 78 square miles.

Accuracy.—Estimated flow within ten per cent. There are occasional short periods, which can not now be definitely determined, for which the estimated discharge previously published is too large, due to the use of a water-surface elevation incorrectly reported one foot too high.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER ABOVE DAM AT CAUGHDENOT, for the year ended June 30, 1919. Mrs. J. R. Hiller and John P. Patterson, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	370.4	370.4	369.95	370.7	370.7	370.3	370.8	370.85	370.6	371.2	371.4	371.25
2	370.1	370.3	370.1	370.7	370.6	370.5	370.9	370.7	370.7	371.25	371.3	371.2
3	370.2	370.25	370.2	370.65	370.8	370.25	370.9	370.8	370.75	371.15	371.3	371.1
4	370.35	370.3	369.9	370.7	370.85	370.2	371.0	370.8	370.75	371.15	371.4	371.0
5	370.35	370.1	370.0	370.65	370.8	370.2	370.9	370.7	370.75	371.3	371.3	371.0
6	370.25	370.1	370.0	370.85	370.9	370.5	370.9	370.75	370.8	371.3	371.4	370.9
7	370.25	370.15	370.0	370.7	370.8	370.2	370.9	370.7	370.9	371.3	371.4	370.9
8	370.15	370.25	370.1	370.8	370.7	370.1	370.9	370.7	370.85	371.4	371.3	370.9
9	370.25	370.25	370.0	370.85	370.8	370.1	370.85	370.65	370.9	371.45	371.3	370.9
10	370.3	370.45	370.0	370.8	370.5	370.2	370.9	370.6	370.9	371.5	371.3	370.9
11	370.3	370.4	370.2	370.6	370.65	370.45	370.8	370.65	371.0	371.5	371.35	370.8
12	370.3	370.35	370.1	370.55	370.6	370.1	370.8	370.6	371.1	371.6	371.3	370.9
13	370.3	370.35	370.1	370.5	370.55	370.25	370.8	370.6	371.1	371.8	371.35	370.85
14	370.25	370.25	370.0	370.5	370.5	370.3	370.75	370.7	371.1	371.8	371.4	370.8
15	370.5	370.25	370.2	370.45	370.5	370.4	370.7	370.6	371.2	371.85	371.4	370.7
16	370.5	370.2	370.0	370.4	370.45	370.5	370.7	370.6	371.2	372.0	371.3	370.7
17	370.45	370.2	370.2	370.4	370.5	370.6	370.7	370.6	371.2	371.8	371.3	370.7
18	370.45	370.2	370.4	370.35	370.4	370.55	370.75	370.6	371.15	371.65	371.25	370.7
19	370.45	370.2	370.3	370.35	370.4	370.55	370.6	370.6	371.25	371.65	371.35	370.65
20	370.45	370.1	370.45	370.3	370.5	370.55	370.7	370.6	371.3	371.6	371.5	370.5
21	370.5	370.15	370.45	370.35	370.5	370.5	370.7	370.7	371.3	371.55	371.4	370.6
22	370.45	370.0	370.4	370.4	370.5	370.5	370.7	370.65	371.3	371.5	371.4	370.6
23	370.45	370.1	370.5	370.4	370.4	370.5	370.75	370.6	371.3	371.5	371.4	370.5
24	370.5	370.0	370.5	370.3	370.5	370.7	370.6	370.55	371.45	371.4	371.45	370.5
25	370.45	370.15	370.8	370.4	370.25	370.7	370.8	370.6	371.4	371.2	371.45	370.3
26	370.4	370.15	370.7	370.45	370.45	370.7	370.8	370.6	371.3	371.3	371.45	370.6
27	370.45	370.1	370.7	370.5	370.25	370.7	370.8	370.6	371.25	371.85	371.45	370.5
28	370.4	370.0	370.7	370.7	370.5	370.7	370.9	370.65	371.1	371.85	371.4	370.5
29	370.4	370.0	370.6	370.6	370.2	370.7	370.8	370.8	371.0	371.2	371.35	370.5
30	370.3	370.0	370.7	370.5	370.2	370.6	370.85	370.85	371.2	371.3	371.3	370.45
31	370.35	370.0	.....	370.65	.....	370.8	370.85	.....	371.25	.....	371.3	.....

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER BELOW DAM AT CAUGHDENY, for the year ended June 30, 1919. Mrs. J. R. Hiller and John P. Patterson, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	364.4	364.0	363.4	364.6	365.2	364.4	364.6	364.7	364.6	366.2	366.6	366.4
2.....	363.9	363.9	363.7	364.6	365.2	364.7	364.9	364.6	364.7	365.9	366.9	366.2
3.....	364.1	363.8	363.7	364.5	365.1	364.5	365.0	364.6	364.9	366.1	366.8	366.1
4.....	364.0	363.9	363.6	364.6	365.6	364.3	365.1	364.7	364.9	366.2	366.8	365.9
5.....	364.0	363.9	363.6	364.7	365.7	364.3	365.5	364.7	365.0	366.3	366.5	365.7
6.....	363.9	363.8	363.5	364.8	365.6	364.5	365.2	364.7	365.0	365.9	366.6	365.6
7.....	363.8	363.8	363.5	364.7	365.5	364.6	364.9	364.7	365.0	366.0	366.6	365.6
8.....	363.7	363.9	363.5	364.8	365.5	364.4	364.9	364.7	364.9	366.0	366.5	365.6
9.....	363.8	363.9	363.6	364.8	365.3	364.3	364.8	364.6	365.2	366.2	366.4	365.6
10.....	363.9	364.1	363.5	364.7	364.9	364.4	365.2	364.5	365.5	366.4	366.7	365.6
11.....	364.0	364.1	363.7	364.8	365.0	364.6	364.9	364.5	365.7	366.5	366.7	365.6
12.....	364.0	364.1	363.6	364.9	365.9	364.4	365.0	364.4	365.7	367.1	366.7	365.0
13.....	364.0	364.1	363.7	364.8	364.7	364.6	365.1	364.3	365.7	367.4	366.8	364.8
14.....	364.0	363.9	363.7	364.7	364.4	364.7	365.0	364.5	365.7	367.6	366.9	364.7
15.....	364.1	363.9	363.8	364.6	364.7	364.8	364.9	364.5	365.6	367.4	366.7	364.7
16.....	364.1	363.8	364.0	364.6	364.6	365.0	364.8	364.4	365.6	367.8	366.5	364.7
17.....	364.2	363.7	364.0	364.6	364.8	365.0	364.7	364.5	365.7	367.2	366.5	364.7
18.....	364.2	363.7	364.4	364.5	364.8	365.1	364.7	364.4	365.8	367.3	366.4	364.6
19.....	364.1	363.8	364.1	364.5	364.8	364.9	364.6	364.3	366.0	367.2	366.6	364.5
20.....	364.1	363.7	364.5	364.5	364.9	364.9	364.6	364.3	366.1	367.2	366.8	364.4
21.....	364.1	363.7	364.4	364.4	364.8	364.9	364.6	364.3	366.0	367.1	366.8	364.3
22.....	361.1	363.6	361.6	364.5	364.6	364.9	364.6	364.3	366.2	366.6	367.1	364.2
23.....	364.1	363.7	364.6	364.6	364.6	364.9	364.6	364.3	365.9	366.9	366.9	364.3
24.....	364.1	363.5	364.1	364.5	364.6	365.2	364.7	364.4	365.9	366.6	367.0	364.3
25.....	364.1	363.5	364.8	364.5	364.5	365.3	364.9	364.6	366.0	366.5	367.0	364.3
26.....	361.1	363.6	364.7	364.8	364.5	365.3	364.9	364.6	366.2	366.5	367.1	364.2
27.....	364.2	363.6	364.7	364.9	364.4	365.4	364.9	364.6	366.2	366.6	367.1	364.0
28.....	364.2	363.5	364.1	365.0	364.9	365.4	364.9	364.5	365.9	366.7	366.9	364.1
29.....	364.3	363.5	364.6	364.5	364.5	365.3	364.9	364.5	365.8	366.6	366.9	364.3
30.....	364.1	363.4	364.7	364.9	364.3	365.3	364.9	364.5	366.0	366.6	366.6	364.2
31.....	364.1	363.4	.....	365.1	.....	364.8	364.7	.....	366.3	.....	366.5	.....

Daily discharge, in second-feet, of ONEIDA RIVER AT CAUGHDENY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2,195	976	281	1,632	3,546	2,759	2,262	2,394	1,793	2,880	4,643	4,201
2.....	1,684	797	489	1,632	3,300	3,213	2,513	2,022	2,012	3,030	4,293	4,063
3.....	602	710	624	1,522	3,820	2,832	2,512	2,264	2,132	2,740	4,309	3,775
4.....	874	801	218	1,628	3,959	2,846	2,784	2,265	2,136	2,910	4,617	3,526
5.....	870	473	337	1,518	3,798	2,609	2,512	2,022	2,135	3,500	4,341	3,553
6.....	686	477	343	2,002	4,085	3,254	2,515	2,140	2,255	3,180	4,641	3,271
7.....	702	549	343	1,630	3,810	2,641	2,515	2,018	2,508	3,180	4,645	3,279
8.....	527	700	469	1,870	3,539	2,661	2,515	2,015	2,399	3,450	4,341	3,283
9.....	694	708	337	1,998	3,811	2,663	2,395	1,905	2,512	3,640	4,357	2,691
10.....	789	1,070	335	1,866	3,060	2,839	2,513	1,794	2,512	3,800	4,317	2,080
11.....	779	986	636	3,279	3,419	3,372	2,260	1,905	2,772	3,800	4,473	1,828
12.....	779	878	461	3,161	3,250	2,656	2,259	1,793	3,045	4,120	4,323	2,078
13.....	785	898	461	3,039	3,192	2,937	2,258	1,794	3,052	4,780	4,463	1,956
14.....	708	702	349	3,035	3,098	3,028	2,135	2,013	3,055	4,780	4,613	1,848
15.....	1,156	708	612	2,933	3,067	2,822	2,017	1,792	3,335	4,950	4,637	1,606
16.....	1,162	628	335	2,816	2,961	3,267	2,017	1,794	3,335	5,540	4,351	1,594
17.....	1,050	628	618	2,812	3,055	3,660	2,015	1,795	3,399	5,945	4,351	1,594
18.....	1,060	630	964	2,710	2,834	3,530	2,133	1,802	3,194	5,413	4,205	1,596
19.....	1,054	624	791	2,706	2,830	3,541	1,794	1,805	3,492	5,425	4,501	1,488
20.....	1,066	467	1,060	2,605	3,052	3,539	2,014	1,806	3,645	5,259	4,955	1,154

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 139

Daily discharge in second-feet, of ONEIDA RIVER AT CAUGHDENY, for the year ended June 30, 1919 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	1,162	545	1,068	2,725	3,053	3,414	2,013	2,028	3,647	5,105	4,621	1,384
22.....	1,056	349	972	2,814	3,072	3,416	2,012	1,922	3,650	4,951	4,617	1,394
23.....	1,056	473	1,168	2,818	2,832	3,417	2,135	1,805	3,652	4,967	4,615	1,370
24.....	1,168	345	1,156	2,609	3,064	3,907	1,797	1,690	4,110	4,667	4,765	1,158
25.....	1,060	557	1,842	2,808	2,553	3,889	2,259	1,793	3,695	4,055	4,769	775
26.....	966	543	1,602	2,909	2,965	3,896	2,261	1,793	3,180	4,367	4,751	1,372
27.....	1,056	473	1,606	2,939	2,523	3,912	2,262	1,794	3,030	6,189	4,757	1,150
28.....	966	343	1,600	3,536	3,056	3,914	2,512	1,903	2,600	6,180	4,605	1,162
29.....	962	341	1,382	3,271	2,446	3,896	2,264	.....	2,330	4,043	4,479	1,172
30.....	779	339	1,596	3,033	2,421	3,673	2,394	.....	2,880	4,359	4,351	1,056
31.....	872	349	.....	3,397	.....	2,260	2,394	.....	3,030	.....	4,349	.....
Mean...	978	615	802	2,557	3,182	3,234	2,266	1,924	2,918	4,374	4,518	2,082

Monthly discharge of ONEIDA RIVER AT CAUGHDENY, for the year ended June 30, 1919
[Drainage area, 1,377 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	2,195	527	978	0.710	0.819
August.....	1,070	339	615	0.447	0.515
September.....	1,842	218	803	0.582	0.649
October.....	3,536	1,518	2,557	1.857	2.141
November.....	4,085	2,421	3,182	2.311	2.578
December.....	3,914	2,260	3,234	2.348	2.707
January.....	2,784	1,794	2,266	1.646	1.898
February.....	2,394	1,690	1,924	1.397	1.455
March.....	4,110	1,793	2,918	2.119	2.443
April.....	6,189	2,740	4,374	3.176	3.544
May.....	4,955	4,205	4,518	3.281	3.782
June.....	4,201	775	2,082	1.512	1.687
The year.....	6,189	218	2,454	1.782	24.218

ONEIDA RIVER AT OAK ORCHARD

Gage No. 182

This station is located on the Oak Orchard highway bridge, also known as Schroepfel's bridge, across the Oneida river at Oak Orchard, about $7\frac{5}{8}$ miles upstream from the junction of the Oneida and Seneca rivers. It was established April 23, 1904, just below the old lock at the Oak Orchard dam and then indicated the water-surface below the dam. On August 1, 1915, the gage was moved to the lower end of the south side of the old pier near the south, or left bank. The bridge is about $\frac{1}{3}$ mile below the site of the old dam, which has been removed in connection

with the canalization of the Oneida river for the Barge canal. Previous to 1914 this record was published as "below dam."

On July 18, 1916, the staff gage was replaced by a standard Type A gage, No. 182, in the same location, having a range of 12 feet, between elevations 361.0 and 373.0. The gage benchmark is on the northeast corner of south abutment of Schroeppe's bridge and is at elevation 370.489 (B. C. datum).

The gage is read once daily—A. M.—to quarter-tenths.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER AT OAK ORCHARD, for the year ending June 30, 1919. LaRue Sitterly, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.85	363.95	363.45	364.60	364.42	364.12	364.25	364.20	364.22	364.85	365.35	365.05
2.....	363.68	363.88	363.52	364.58	364.45	364.22	364.22	364.18	364.32	364.82	365.55	365.00
3.....	363.72	363.82	363.52	364.55	364.50	364.15	364.28	364.15	364.42	364.80	365.38	364.75
4.....	363.80	363.78	363.50	364.50	364.42	364.08	364.30	364.12	364.42	364.90	365.28	364.40
5.....	363.85	363.92	363.50	364.40	364.38	364.05	364.30	364.15	364.45	365.05	365.10	364.38
6.....	363.85	363.85	363.52	364.25	364.38	364.02	364.30	364.20	364.48	364.98	365.20	364.25
7.....	363.85	363.80	363.48	364.22	364.32	364.00	364.32	364.22	364.48	364.88	365.22	364.28
8.....	363.62	363.82	363.50	364.20	364.22	364.02	364.32	364.28	364.48	364.90	365.22	364.40
9.....	363.65	363.82	363.52	364.15	364.15	364.05	364.32	364.25	364.50	364.95	365.25	364.42
10.....	363.70	363.80	363.53	364.08	364.05	364.10	364.32	364.28	364.60	364.98	365.50	364.30
11.....	363.85	363.80	363.52	363.98	364.12	364.20	364.35	364.20	364.98	365.02	365.25	364.50
12.....	363.92	363.80	363.55	364.30	364.20	364.28	364.38	364.20	365.00	365.82	366.28	364.40
13.....	363.88	363.78	363.70	364.30	364.08	364.32	364.38	364.22	364.90	365.95	365.52	364.20
14.....	363.90	363.75	363.72	364.25	364.12	364.40	364.38	364.25	364.80	366.02	365.65	364.10
15.....	363.95	363.70	363.80	364.08	364.18	364.40	364.35	364.28	364.82	365.90	365.38	364.08
16.....	363.88	363.65	363.85	364.05	364.22	364.05	364.35	364.22	364.82	365.90	365.22	364.05
17.....	363.90	363.60	363.90	364.05	364.22	364.15	364.35	364.18	364.80	366.48	365.20	364.02
18.....	363.88	363.60	363.95	364.02	364.20	364.20	364.35	364.00	364.90	366.68	365.15	364.08
19.....	363.85	363.60	364.05	364.02	364.20	364.28	364.32	363.92	364.85	366.28	365.05	364.10
20.....	363.85	363.62	364.20	364.02	364.18	364.28	364.32	363.85	364.72	365.25	365.10	364.03
21.....	363.85	363.62	364.62	364.02	364.18	364.28	364.32	363.75	364.68	365.15	365.22	363.98
22.....	363.88	363.58	364.68	364.05	364.15	364.22	364.30	363.70	364.65	365.30	365.28	363.90
23.....	363.90	363.52	364.72	364.10	364.12	364.20	364.30	363.80	364.52	365.30	365.42	363.88
24.....	363.92	363.45	364.70	364.10	364.12	364.35	364.30	363.95	364.60	365.28	365.50	363.85
25.....	363.98	363.48	364.65	364.05	364.12	364.50	364.28	364.15	364.70	365.25	365.72	363.85
26.....	364.02	363.50	364.70	364.35	364.15	364.45	364.28	364.15	364.75	365.25	365.70	363.85
27.....	364.00	363.50	364.75	364.32	364.12	364.42	364.28	364.18	364.82	365.25	365.72	363.85
28.....	364.02	363.48	364.80	364.30	364.10	364.32	364.28	364.20	364.78	365.28	365.60	363.80
29.....	364.10	363.42	364.78	364.28	364.05	364.25	364.25	.....	364.82	365.30	365.35	363.85
30.....	364.02	363.38	364.70	364.25	364.10	364.25	364.25	.....	364.90	365.32	365.20	363.90
31.....	363.98	363.42	.....	364.45	.....	364.25	364.20	.....	364.85	.....	365.10	.....

ONEIDA RIVER AT THREE RIVER POINT

Gage No. 181

This station, located at Three River Point, the junction of Seneca and Oneida rivers, which form the Oswego river, was established April 16, 1904. On July 17, 1916, the staff gage on the upstream end of the most northerly pier of the temporary tow-path bridge over Oneida river was superseded by a standard Type A gage, No. 181, in two sections. The lower section is

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 141

secured to the south face of east end of boat landing of Three River dock, and has a range of 4 feet, between elevations 360.0 and 364.0. The upper section is secured to the west wing wall of south abutment of the highway bridge over Oneida river, and has a range of 8 feet, between elevations 364.0 and 372.0. A standard bench-mark plug is set in the face of the wall near the upper section at elevation 368.0 (B. C. datum).

The gage is read once daily — A. M. — to tenths.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER AT THREE RIVER POINT, for the year ended June 30, 1919. Fred Chamberlain, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.85	363.70	363.30	364.10	364.15	363.80	363.80	363.90	364.00	364.55	364.95	364.70
2.....	363.60	363.60	363.50	364.00	364.10	364.10	364.10	363.88	364.20	364.55	365.15	364.65
3.....	363.70	363.65	363.55	364.00	364.20	363.90	364.10	363.88	364.35	364.55	364.90	364.40
4.....	363.80	363.70	363.55	363.90	364.25	363.90	364.05	363.95	364.35	364.65	364.70	364.15
5.....	363.80	363.75	363.50	364.00	364.15	363.80	363.88	364.00	364.30	364.90	364.65	363.90
6.....	363.75	363.80	363.50	364.10	364.05	363.85	364.05	363.95	364.35	364.70	364.75	363.95
7.....	363.80	363.70	363.40	364.20	364.05	363.90	363.90	364.20	364.25	364.70	364.70	364.00
8.....	363.60	363.70	363.45	364.15	363.95	363.85	363.92	364.25	364.20	364.60	364.60	364.80
9.....	363.60	363.80	363.70	364.05	363.90	363.95	363.95	364.10	364.35	364.80	364.40	364.80
10.....	363.70	363.80	363.50	364.00	363.90	363.95	363.90	364.00	364.80	364.65	364.65	364.20
11.....	363.85	363.75	363.45	363.90	363.90	363.95	363.85	363.90	364.90	364.95	364.85	364.40
12.....	363.90	364.00	363.55	364.15	364.00	363.98	364.10	363.90	364.80	365.40	364.85	364.30
13.....	363.85	363.85	363.65	364.20	363.90	363.95	364.25	363.80	364.60	365.65	365.10	364.15
14.....	363.85	363.75	363.65	364.05	363.70	364.22	364.30	364.10	364.65	365.60	365.10	364.00
15.....	363.75	363.65	363.65	363.90	364.00	364.20	364.20	364.10	364.55	365.40	364.90	364.10
16.....	363.80	363.65	363.85	363.95	364.10	364.22	364.10	363.90	364.45	365.15	364.75	364.05
17.....	363.75	363.50	363.80	364.00	364.10	364.20	364.15	364.00	364.60	364.95	364.60	364.10
18.....	363.75	363.60	363.85	363.90	364.22	364.10	364.15	363.90	364.75	364.80	364.65	364.20
19.....	363.75	363.70	363.90	363.90	364.15	364.00	364.10	363.90	364.95	364.70	364.65	364.20
20.....	363.80	363.60	364.10	363.95	364.10	363.95	363.95	363.80	365.00	364.65	364.75	363.90
21.....	363.80	363.60	364.15	364.00	364.00	364.00	363.98	363.75	365.00	364.60	364.70	363.80
22.....	364.00	363.60	364.25	363.95	363.85	363.98	364.00	363.70	364.80	364.85	364.65	363.80
23.....	363.85	363.50	364.15	363.90	363.95	364.00	364.00	363.75	364.70	364.90	365.00	363.95
24.....	363.90	363.40	364.10	363.95	363.95	364.20	364.20	364.00	364.65	364.90	365.05	364.05
25.....	363.95	363.35	364.10	363.90	363.90	364.30	364.15	364.10	364.60	364.75	365.30	363.95
26.....	363.95	363.50	364.10	364.10	363.90	364.25	364.15	364.15	364.60	364.88	365.30	363.80
27.....	363.90	363.50	364.20	364.20	363.95	364.15	364.10	364.10	365.60	365.00	365.30	363.75
28.....	363.90	363.50	364.25	364.00	363.95	364.00	364.05	364.00	365.45	364.85	365.15	363.90
29.....	364.05	363.40	364.20	364.05	363.90	363.95	364.05	.....	364.00	364.85	364.90	364.00
30.....	363.85	363.30	364.10	364.00	363.80	363.85	364.00	.....	364.65	364.95	364.75	363.90
31.....	363.90	363.25	.....	364.10	.....	363.85	363.95	.....	364.65	.....	364.65	.....

ONEIDA LAKE

Oneida lake, with a water-surface of 78 square miles, is about 20¾ miles long and 4 to 5 miles wide the greater part of its length. Its depth varies from 20 to 50 feet, but there are several shoals. The total drainage area above its outlet is 1,353 square miles, of which the lake surface constitutes five and three-quarters

per cent. The drainage basin within a radius of 10 miles to the south and west is relatively flat, with numerous swampy tracts. The lake receives, through Chittenango and Oneida creeks, drainage from an extensive area of the central New York plateau and, through Wood and Fish creeks on the east, drainage from a portion of the west slope of the plateau bordering the Adirondack mountains. On the north the drainage area is less extensive and the inflowing streams are small.

The Barge canal traverses the length of the lake. A low navigable surface is maintained at elevation 369.9 by the Caughdenoy dam 4 miles down the Oneida river, a description of which is given under the Oneida river.

For elevation of west end of Oneida lake see Oneida river at Brewerton.

The following table gives the elevations of extreme high and low-water surface each year of Oneida lake as indicated by gages at Brewerton at the west and Sylvan Beach at the east end of the lake. The gage at Brewerton is about 1,500 feet down the outlet, while that at Sylvan Beach is about 800 feet up Fish creek from the lake. The difference between extreme surface at each end of the lake is probably mainly due to wind, supplemented by such slight slope between the gage and lake as may occur during times of large flow.

Annual high and low water-surface elevation of ONEIDA LAKE

YEAR	BREWERTON			SYLVAN BEACH		
	SURFACE ELEVATION		Range	SURFACE ELEVATION		Range
	High	Low		High	Low	
			<i>Feet</i>			<i>Feet</i>
1904.....	374.0	369.1	4.9	.....	.....	.....
1905.....	374.9	369.9	5.0	375.4	370.5	4.9
1906.....	372.8	368.7	4.1	373.1	368.9	4.2
1907.....	372.9	369.1	3.8	373.1	369.2	3.9
1908.....	373.4	368.6	4.8	373.7	368.5	5.2
1909.....	374.5	370.0	4.5	374.5	369.8	4.7
1910.....	373.9	369.1	4.8	374.0	370.0	4.0
1911.....	374.2	370.2	4.0	374.3	369.7	4.6
1912.....	375.3	370.2	5.1	376.9	370.0	6.9
1913.....	375.3	369.6	5.7	377.0	369.3	7.7
1914.....	374.2	369.7	4.5	375.8	369.8	6.0
1915.....	372.5	369.5	3.0	372.4	369.5	2.9
1916.....	374.0	369.3	4.7	374.0	369.9	4.1
1917.....	374.5	369.0	5.5	374.2	369.1	5.1
1918.....	373.25	370.1	3.15	373.0	369.6	3.4

ONEIDA LAKE AT SYLVAN BEACH

Gage No. 186

This station, established July 1, 1904, is located at the east end of Oneida lake, at Sylvan Beach. A staff gage, attached to the corner of the crib dock on the right, or north bank of canalized Fish creek, just above, or east of Railroad street bridge and about 800 feet from the lake, was in use until May 31, 1917. On May 31, 1917, a standard Type A gage, No. 186, in two sections, was erected in practically the same location. The lower section has a range of 8 feet, between elevations 367.0 and 375.0. The upper section is secured to the north face of the north abutment of the Sylvan Beach bridge and has a range of 4 feet, between elevations 373.0 and 377.0. The gage benchmark is a wooden plug in top of north abutment, Sylvan Beach bridge, between piers, and is at elevation of 377.0 (B. C. datum).

The gage was read twice daily—at 9 A. M. and 2 P. M.—during July, to tenths; once daily thereafter, to tenths and half-tenths.

Daily elevation of water-surface (B. C. datum) of ONEIDA LAKE AT SYLVAN BEACH, for the year ended June 30, 1919. Wm. H. Dunn and L. A. Withey, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	371.4	370.4	370.2	371.05	371.3	370.65	371.15	371.25	370.9	372.05	372.05	372.0
2.....	371.5	370.45	370.1	371.05	371.4	370.6	371.25	371.2	371.05	372.0	372.35	371.85
3.....	371.6	370.45	369.95	371.15	371.4	370.65	371.35	371.15	371.1	371.9	372.55	371.8
4.....	371.6	370.35	370.05	371.05	371.35	370.6	371.5	371.1	371.05	371.9	372.4	371.75
5.....	371.4	370.3	370.1	371.0	371.4	370.6	371.45	371.1	371.15	371.85	372.5	371.6
6.....	371.3	370.3	370.2	371.0	371.3	370.55	371.35	371.05	371.25	371.9	372.3	371.5
7.....	371.2	370.3	370.1	371.05	371.25	370.45	371.3	371.0	371.25	372.1	372.2	371.45
8.....	371.2	370.35	370.15	371.1	371.2	370.4	371.3	371.0	371.25	372.1	372.2	371.3
9.....	371.3	370.5	370.1	371.1	371.1	370.45	371.25	370.95	371.25	372.15	372.05	371.25
10.....	371.4	370.35	370.15	371.1	371.25	370.4	371.25	370.9	371.45	372.2	371.85	371.2
11.....	371.4	370.45	369.95	371.1	371.05	370.4	371.25	370.85	371.65	372.4	372.05	371.15
12.....	371.4	370.5	370.05	371.05	371.0	370.4	371.2	370.8	371.65	372.65	372.2	371.05
13.....	371.5	370.5	370.3	371.0	370.85	370.45	371.15	370.8	371.7	373.45	372.25	371.05
14.....	371.4	370.55	370.2	370.9	370.9	370.45	371.1	370.8	371.7	373.1	372.35	371.05
15.....	371.3	370.5	370.1	370.8	370.8	370.75	371.05	370.85	371.65	373.05	372.2	371.0
16.....	371.0	370.45	370.15	370.7	370.65	370.9	371.05	370.95	371.75	372.85	372.1	371.0
17.....	370.9	370.35	370.5	370.65	370.6	370.95	371.0	370.95	371.7	373.0	372.05	371.0
18.....	370.9	370.3	370.45	370.65	370.75	371.0	371.0	370.95	371.8	372.95	372.15	370.95
19.....	370.8	370.25	370.55	370.6	370.85	370.9	371.0	370.9	371.9	372.9	372.3	370.9
20.....	370.8	370.25	370.7	370.6	370.9	370.85	370.95	370.9	372.0	372.8	372.25	370.9
21.....	370.7	370.2	370.95	370.7	371.0	370.8	370.95	370.85	372.1	372.75	372.2	370.9
22.....	370.7	370.25	371.05	370.65	371.0	370.85	370.9	370.8	372.1	372.6	372.15	370.9
23.....	370.8	370.2	370.9	370.65	371.2	371.05	370.9	370.8	372.15	372.45	372.35	370.8
24.....	370.8	370.25	371.1	370.55	371.1	371.0	371.05	370.8	372.15	372.7	372.4	370.75
25.....	370.7	370.25	371.05	370.6	371.0	371.1	371.15	370.85	372.1	372.6	372.5	370.7
26.....	370.6	370.25	371.05	370.75	370.85	371.35	371.25	370.9	372.05	372.55	372.5	370.7
27.....	370.6	370.2	371.2	370.9	370.7	371.3	371.25	370.9	372.0	372.35	373.5	370.75
28.....	370.5	370.0	371.1	371.15	370.6	371.25	371.25	370.85	372.35	372.25	372.4	370.7
29.....	370.5	370.15	371.25	371.0	370.85	371.25	371.3	.....	372.35	372.3	372.3	370.65
30.....	370.5	370.15	371.05	371.05	370.9	371.2	371.3	.....	372.05	372.15	372.2	370.65
31.....	370.5	370.2	.....	371.2	.....	371.2	371.3	.....	372.1	.....	372.1	.....

CHITTENANGO CREEK

DESCRIPTION

Chittenango creek is the principal tributary of Oneida lake from the south. It comprises three main branches, namely, Butternut creek, Limestone creek and Chittenango creek proper. The three branches join near North Manlius. Above the junction with Butternut creek, Chittenango creek flows through an irregular dumb-bell-shaped area extending in a northwest and southeast direction. This area lies chiefly in the dissected, hilly region south of the line of the New York Central railroad. The length of the basin is about 22 miles. Its width in the upper portion is 9 miles; in the middle portion, 4 miles; in the lower portion, 7 miles. The drainage basin is deeply rolling, mostly cleared, and has a heavy, impervious soil with extensive sodded-meadow areas. The soil is underlaid by shale rock, often outcropping, and affording numerous springs. The stream tributaries are somewhat sparse. Marsh and swamp areas are very limited, with the exception of the Nelson swamp, about two square miles in area.

The outflow from Cazenovia lake is regulated and there is also a reservoir at Erieville. These reservoirs are used to supply the summit level of the Erie canal. The capacities of these reservoirs are given as follows in New York State Barge Canal Report for 1901, page 663:

Erieville Reservoir

Storage capacity	318,424,000 cubic feet
Water-surface	340 acres

Cazenovia Lake

Storage capacity	206,997,000 cubic feet
Water-surface	1.7 square miles

The head of the stream is near Erieville reservoir, which is formed by a dam crossing a small stream valley, formerly tributary to Chenango river through Eaton brook. Cazenovia lake is located 10 miles below Erieville reservoir, which is at the head of the stream at elevation 1,190. From its outlet to the foot of the plateau at Erie canal crossing, the stream descends 770 feet, the distance, following the general trend of the valley, being 11 miles. At Chittenango falls there occurs a precipitous descent of about 100 feet.

CHITTENANGO CREEK AT CHITTENANGO

Gage No. 191

This station, established May 22, 1901, is located at the Main street bridge over Chittenango creek at Chittenango. This was originally a discharge station, but since 1911 it has been maintained for water-surface elevation only. A staff gage, secured to the downstream end of the left abutment of the bridge, was used until September 28, 1916, when it was replaced by a standard Type A gage, No. 191, having a range of 8 feet, between elevations 449.0 and 457.0. The gage bench-mark is the top of the concrete coping at angle with wing, east abutment, upstream side of Main street bridge, and is at elevation 458.905 (B. C. datum).

The gage is read twice daily—7 to 8 A. M. and 4 P. M.—to hundredths.

Daily elevation of water-surface (B. C. datum) of CHITTENANGO CREEK AT CHITTENANGO, for the year ended June 30, 1919. W. S. Siver, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	451.80	451.68	.....	.....	452.00	451.78	452.08	452.60	452.85	452.25	452.42	452.00
2.....	451.82	451.60	.....	.....	451.92	451.82	452.55	452.85	452.12	452.30	452.45	452.00
3.....	451.72	451.62	.....	.....	451.82	451.82	452.08	452.80	451.98	451.98	452.30	451.95
4.....	451.90	451.62	.....	.....	451.98	451.82	451.92	452.80	452.00	452.45	452.10	451.92
5.....	451.80	451.64	.....	.....	452.08	451.72	451.92	452.80	452.04	452.65	452.28	452.00
6.....	451.72	451.62	.....	.....	452.00	451.78	451.88	452.80	451.94	452.90	452.30	451.98
7.....	451.70	451.61	.....	.....	451.92	451.74	451.88	452.85	451.90	452.92	452.30	451.95
8.....	451.68	451.65	.....	.....	451.82	451.80	451.88	452.80	451.79	452.98	452.25	451.92
9.....	451.78	451.75	.....	.....	451.75	452.05	451.90	452.85	452.68	452.75	452.18	451.90
10.....	451.88	451.78	.....	.....	451.85	451.88	451.95	452.75	452.60	452.80	452.28	451.85
11.....	451.92	451.65	.....	452.00	451.82	451.88	451.82	452.85	452.28	453.05	453.25	451.80
12.....	451.88	451.60	.....	452.00	451.78	451.82	451.98	452.65	452.05	453.20	452.82	451.82
13.....	451.90	451.59	.....	451.75	451.79	451.84	452.00	453.85	452.15	453.18	452.80	451.78
14.....	451.98	451.61	.....	451.78	451.84	452.02	451.82	453.65	451.92	452.82	452.55	451.75
15.....	452.12	451.58	.....	451.80	451.92	452.48	451.84	453.30	452.00	452.68	452.45	451.75
16.....	451.82	.....	.....	451.85	451.98	452.20	451.80	452.95	452.35	452.65	452.30	452.20
17.....	451.82	.....	.....	451.78	451.91	452.05	451.84	453.35	452.60	452.58	452.55	452.00
18.....	451.78	.....	.....	451.78	452.04	451.88	451.86	452.05	452.65	452.58	452.55	451.95
19.....	451.80	.....	.....	451.75	451.98	451.82	451.82	452.75	452.25	452.45	452.28	451.82
20.....	451.72	.....	.....	451.72	451.88	451.86	451.81	452.65	452.08	452.35	452.20	451.82
21.....	451.72	.....	.....	451.78	451.92	451.88	451.79	452.75	452.05	452.38	452.12	451.98
22.....	451.72	.....	.....	451.76	451.90	452.00	451.84	452.80	451.98	452.26	452.80	451.80
23.....	451.68	.....	.....	451.72	451.96	452.21	452.22	451.85	451.92	452.35	452.85	451.82
24.....	451.88	.....	.....	451.72	451.85	452.05	452.55	451.75	452.00	452.18	452.68	451.82
25.....	451.75	.....	.....	451.80	451.84	452.35	452.12	451.65	452.00	452.20	452.52	451.80
26.....	451.78	.....	.....	451.91	451.78	452.12	452.45	451.75	452.25	452.38	452.35	451.82
27.....	451.74	.....	.....	451.78	451.78	452.00	452.46	451.65	452.00	452.62	452.28	451.98
28.....	451.75	.....	.....	451.68	451.79	451.98	452.15	451.85	452.10	452.75	452.18	451.95
29.....	451.75	.....	.....	451.62	451.88	451.92	451.65	.....	452.30	452.70	452.10	451.80
30.....	451.68	.....	.....	451.85	451.88	451.88	451.69	.....	452.00	452.35	452.00	451.78
31.....	451.78	.....	.....	452.55	.....	451.82	452.62	.....	452.12	.....	451.98	.....

NOTE.—Gage removed; new bridge under construction, August 16 to October 10.

BUTTERNUT CREEK**DESCRIPTION**

The headwaters of Butternut creek lie at elevation 1,700 feet, near the south line of Onondaga county. This stream drains a narrow basin about 24 miles in length and having an average width of about 3 miles. The stream flows in a northerly direction. Jamesville reservoir is located 14 miles below the source at elevation about 640. North of the Erie canal the stream flows out into the flat lands, at elevation about 400, which border Oneida lake for a width of several miles. Butternut creek is joined by Limestone creek near North Manlius at a point about $1\frac{1}{2}$ miles above its junction with Chittenango creek. The Erie canal crosses the stream $4\frac{1}{2}$ miles below Jamesville. Above the Erie canal crossing the slopes are steep and the tributaries are mostly short laterals. Jamesville reservoir has a capacity of 170,000,000 cubic feet. The water-surface area is 252 acres. At a distance of 2.35 miles below Jamesville there is a dam which diverts part of the stream to the Orrville feeder. This feeder is 2.25 miles in length.

BUTTERNUT CREEK AT JAMESVILLE

Location.—At the first bridge over Butternut creek above the head of the Orrville feeder and about $1\frac{1}{2}$ miles below the village of Jamesville.

Drainage area.—53 square miles.

Records available.—Gage heights, July 25, 1907, to June 30, 1919. Discharge, July 25, 1907, to September 15, 1915, and July 1, 1916, to June 30, 1918.

Gage.—Standard chain gage secured to left abutment of old bridge, read to tenths twice daily — at 8 A. M. and 4 P. M.

Discharge measurements.—Made from downstream side of bridge, and by wading above and below gage.

Discharge computations.—Due to changes in the control in September, 1915, and October, 1916, it has been necessary to establish new rating curves. A curve that applied from July 1 to October 17, 1916, was established from two current-meter measurements and by comparison with previous and subsequent curves. It was found that this curve could not be applied to the period from September, 1915, to July 1, 1916, probably due to changes in the control.

The curve established from measurements made since October 18, 1916, is fairly well defined for gage heights up to 3.6 feet. Above that, the discharge is approximate only.

Control.—Gravel rift 400 feet below gage; changeable. The control was materially raised by deposit of gravel during flood about September 14, 1915. A channel was opened through this gravel rift in October, 1916, to lower the water during repairs to the bridge.

Extremes of discharge.—1907–1918: Maximum stage recorded, 7.2 feet, January 1, 1917, at 8 A. M. and 4 P. M.; discharge not available. Minimum stage recorded, 0.10 foot, 10 days in June and 10 days in July, 1909; discharge, 2 second-feet.

Regulation.—By the Jamesville reservoir for the water-supply of the Erie canal, capacity 170,000,000 cubic feet, water-surface area 252 acres. Daily flow affected by operation of mill about a mile upstream.

Daily gage height, in feet, of BUTTERNUT CREEK NEAR JAMESVILLE, for the year ended June 30, 1919. Marie Brandt Brown, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	2.75	2.55	2.05	1.8	1.65	1.6	1.35	2.75	2.85	2.9	3.05
2.....	2.8	2.55	2.0	1.8	1.7	1.55	1.35	2.85	2.75	2.85	3.1
3.....	2.9	2.7	2.0	1.7	1.7	1.55	1.35	2.85	2.75	2.95	3.05
4.....	2.85	2.75	1.9	1.7	1.65	1.45	1.45	2.75	2.9	3.0	3.15
5.....	2.8	2.75	1.9	1.7	1.6	1.5	1.55	2.85	2.95	3.05	3.25
6.....	2.75	2.7	1.85	1.75	1.65	1.45	1.65	2.85	2.9	3.1	3.2
7.....	2.9	2.65	1.8	1.7	1.7	1.45	1.65	2.75	2.85	3.25	3.25
8.....	2.9	2.65	1.7	1.65	1.65	1.45	1.75	2.85	2.85	3.45	3.25
9.....	2.8	2.65	1.7	1.6	1.65	1.55	1.85	2.95	2.85	3.55	3.25
10.....	2.75	2.75	1.75	1.65	1.6	1.45	1.85	3.0	2.75	3.85	3.35
11.....	2.75	2.05	1.8	1.65	1.65	1.5	1.85	3.05	2.75	4.3	3.3
12.....	2.85	2.05	1.8	1.6	1.65	1.55	1.85	2.95	2.75	4.05	3.35
13.....	2.85	2.1	1.75	1.65	1.6	1.5	1.95	3.05	2.75	4.1	3.25
14.....	2.5	2.05	1.8	1.7	1.6	1.45	1.95	3.25	2.85	3.95	3.3
15.....	2.5	2.1	1.7	1.65	1.6	1.45	2.0	3.25	2.9	3.8	3.4
16.....	2.55	2.15	1.75	1.6	1.65	1.4	2.1	3.1	3.0	3.6	3.35
17.....	2.6	2.3	1.7	1.6	1.7	1.4	2.25	3.05	2.9	3.2	3.4
18.....	2.65	2.35	1.7	1.65	1.65	1.35	2.35	3.0	2.95	3.15	3.3
19.....	2.55	2.2	1.8	1.65	1.75	1.35	2.45	2.95	2.95	3.1	3.35
20.....	2.55	2.15	1.8	1.6	1.75	1.45	2.6	3.0	2.85	3.05	3.45
21.....	2.6	2.1	1.85	1.7	1.75	1.45	2.7	3.05	2.95	3.15	3.45
22.....	2.6	2.05	1.8	1.75	1.85	1.4	2.85	3.05	2.95	3.05	3.55
23.....	2.7	2.05	1.8	1.7	1.8	1.45	2.9	3.05	3.0	3.1	3.55
24.....	2.7	2.05	1.75	1.65	1.7	1.45	2.9	3.05	2.95	3.15	3.5
25.....	2.65	2.05	1.75	1.65	1.65	1.45	2.85	3.1	2.95	3.25	3.45
26.....	2.65	2.0	1.8	1.75	1.65	1.4	2.85	2.95	2.9	3.25	3.4
27.....	2.6	2.05	1.7	1.7	1.7	1.35	2.85	2.85	2.8	3.15	3.35
28.....	2.7	2.35	1.7	1.65	1.65	1.35	2.9	2.9	2.8	3.1	3.3
29.....	2.65	2.25	1.7	1.6	1.65	1.35	2.9	.....	2.75	3.05	3.3
30.....	2.7	2.15	1.75	1.7	1.65	1.4	2.85	.....	2.85	3.05	3.3
31.....	2.6	2.05	.....	1.65	.....	1.35	2.85	.....	2.85	.....	3.25

NOTE.—Station discontinued May 31, 1919.

LIMESTONE CREEK

DESCRIPTION

The natural source of Limestone creek is on the slope of Tinselor hills near Erieville, Madison county. In the construction of the Chenango canal, Tioughnioga creek was diverted and DeRuyter reservoir receives the drainage tributary to this stream above the point of diversion and also that from additional area tributary to Limestone creek, making a total area above the reservoir outlet of 18.8 square miles. The reservoir has a capacity of 504,468,000 cubic feet and a surface area of about 1.0 square mile. The stored waters are discharged through Limestone creek during the canal navigation season. Water is diverted to a head-race by a dam below Manlius. The head-race is used as a water-power canal to supply several mills at Fayetteville, at which place there is a second diverting dam. A feeder from the diverting dam enters Erie canal 1.2 miles below Fayetteville. Power is also developed on Limestone creek at Manlius and Edwards Falls. The headwaters of Limestone creek are at elevation 1,900 feet. DeRuyter reservoir is at elevation 1,286 feet. The fall of the stream is rapid in the first 3 miles below the reservoir, the elevation at the lower end of this reach at Delphi being 900 feet. From Delphi to Buellville the creek follows a winding course over a flat valley bottom averaging about one-half mile in width. The descent in 8 miles between these points is 150 feet. Between Buellville and Manlius, a distance of 2 miles, a fall of 200 feet occurs. This is mostly concentrated at Edwards Falls. The west, or Watervale branch of Limestone creek joins the main stream below Manlius. The precipitous descent of about 100 feet in a short distance occurs at this branch at Stone Quarry Falls. The drainage basin is shown on the Syracuse, Tully, Chittenango and Cazenovia sheets of the United States Geological Survey topographic maps.

LIMESTONE CREEK AT MANLIUS

Gage No. 195

Location.— At the Wilcox avenue bridge in the village of Manlius and above the entrance of the west, or Watervale branch.

Drainage area.— 67 square miles. (Measured on U. S. Geological Survey topographic maps.)

GAGING OF STREAMS: OSWEGO-ONEIDA-SENECA BASIN 149

Records available.—Gage height, July 23, 1907, to May 31, 1919. Discharge, January 1, 1911, to September 30, 1915.

Gage.—Standard chain gage attached to downstream side of bridge, read once daily to tenths.

Control.—Rapids about 600 feet below the gage, gravel and boulders, fairly permanent.

Extremes of discharge.—1911–1918: Maximum stage recorded, 7.6 feet, June 11, 1917, at 5 A. M.; discharge not available. Minimum stage recorded, 1.90 feet, August 23, 1913; discharge, 6 second-feet.

Diversion.—Tioughnioga creek, a tributary of the Susquehanna, is diverted to the DeRuyter reservoir and this territory above the point of diversion is included in the discharge area given above.

Regulation.—Seasonal by DeRuyter reservoir, daily by hydro-electric plant 1 mile upstream.

Daily gage height, in feet, of LIMESTONE CREEK AT MANLIUS, for the year ended June 30, 1919. J. R. Bixby, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	3.0	2.5	3.5	3.0	3.2	3.0	3.8	3.2	3.5	3.8	3.6
2	3.2	2.5	3.2	3.2	3.0	3.0	3.0	3.2	3.2	4.0	3.3
3	3.2	2.7	3.0	3.2	3.2	2.8	2.7	3.0	3.2	4.2	3.4
4	3.0	2.5	3.0	3.0	3.0	3.0	2.7	2.8	2.7	3.6	3.9
5	3.2	2.5	3.2	3.2	3.2	3.0	2.5	2.9	2.6	3.6	3.4
6	a	2.7	3.0	3.2	3.0	3.0	2.4	3.0	2.6	3.6	3.0
7	2.7	3.0	3.0	3.2	3.0	3.2	2.4	2.6	2.8	3.4	3.0
8	3.0	3.2	2.7	3.2	3.0	3.5	2.6	2.6	3.5	3.0	3.6
9	3.2	3.0	3.0	3.0	3.3	3.2	2.4	2.6	3.7	4.0	4.0
10	3.0	3.2	3.0	2.8	3.2	3.2	2.4	2.4	4.0	4.2	4.5
11	3.0	3.2	3.3	2.7	3.0	3.0	2.4	2.4	3.6	4.8	4.6
12	3.0	3.2	3.0	2.7	3.0	3.2	2.4	2.6	3.6	3.7	4.0
13	3.2	2.8	2.8	2.7	3.2	3.5	2.4	2.6	3.0	3.8	3.6
14	3.5	3.0	3.0	2.8	2.7	4.2	2.4	3.4	3.0	3.6	3.6
15	3.2	2.7	2.85	3.0	2.6	4.0	2.6	3.6	3.0	3.6	3.0
16	3.0	2.5	3.0	3.0	3.3	4.0	2.4	3.2	3.6	3.8	3.4
17	3.5	2.5	3.2	2.7	2.6	3.8	2.5	3.1	4.2	3.6	4.0
18	3.0	2.5	3.5	2.7	3.5	3.0	2.6	3.0	3.4	3.6	3.3
19	3.0	3.0	3.0	2.6	3.2	3.0	2.7	2.6	3.0	3.0	3.5
20	2.8	2.7	3.0	3.0	3.6	3.0	3.0	2.6	3.0	3.3	4.0
21	3.0	2.5	3.2	3.5	3.2	3.2	3.6	2.4	3.0	3.4	4.6
22	3.2	2.5	3.2	3.0	3.2	3.2	3.8	3.7	3.0	3.0	4.0
23	3.0	2.5	3.0	2.7	3.2	3.0	4.2	3.3	3.0	2.6	3.6
24	2.7	3.0	3.7	2.5	3.2	3.0	3.6	3.0	3.0	3.6	3.5
25	2.8	2.8	3.2	2.7	3.0	3.55	3.2	3.0	2.6	3.6	3.6
26	2.8	2.7	3.8	2.7	3.0	3.2	3.2	3.6	2.6	3.6	3.4
27	3.0	3.0	3.2	2.5	2.7	3.0	3.2	3.0	4.2	3.4	3.4
28	2.7	3.2	3.2	2.7	3.3	3.0	3.0	3.0	4.0	3.4	3.4
29	2.7	3.2	3.0	2.7	2.8	2.7	3.0	....	3.8	3.2	3.4
30	2.8	3.0	3.2	3.8	3.0	2.6	3.0	....	3.6	3.6	3.2
31	2.7	3.0	....	3.5	....	3.0	3.2	....	3.6	....	....

NOTE.—Station discontinued May 30, 1919. a No record.

LIMESTONE CREEK AT FAYETTEVILLE

Gage No. 194

This station, established August 27, 1905, is located above the State dam at the head of the Erie canal feeder at Fayetteville. A staff gage, secured to the south abutment of the State dam, was used until August 23, 1916, when a standard Type A gage, No. 194, was erected on the west wing of the south abutment of the bridge over the feeder. This gage has a range of 6 feet, between elevations 429.0 and 435.0. The gage bench-mark is a square cut in top of wall at gage and is at elevation 434.664 (B. C. datum).

The gage is read once daily — at noon — to half-tenths.

Daily elevation of water-surface (B. C. datum) of LIMESTONE CREEK ABOVE DAM AT FAYETTEVILLE, for the year ended June 30, 1919. D. R. Burhans, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	431.45	431.10	430.85	431.05	431.50	431.50	431.85	431.60	431.60	431.70	431.76	431.57
2.....	431.50	431.20	430.70	431.20	431.50	431.60	431.80	431.60	431.60	431.75	431.85	431.55
3.....	431.50	431.20	430.55	431.50	431.50	431.40	431.80	431.60	431.80	431.75	431.75	431.50
4.....	431.60	431.15	430.65	431.40	431.70	431.40	431.65	431.60	431.70	432.17	431.72	431.47
5.....	431.40	431.25	430.75	431.35	431.60	431.40	431.60	431.60	431.70	432.30	431.77	431.47
6.....	431.35	431.25	430.90	431.45	431.60	431.45	431.50	431.60	431.75	432.13	431.71	431.45
7.....	431.35	431.20	431.45	431.30	431.40	431.40	431.50	431.55	431.75	432.57	431.65	431.50
8.....	431.30	431.25	431.30	431.20	431.40	431.40	431.60	431.55	431.75	432.16	431.67	431.46
9.....	431.30	431.30	430.70	431.30	431.40	431.40	431.60	431.50	431.80	432.24	431.66	431.45
10.....	431.40	431.40	430.60	431.35	431.40	431.50	431.65	431.50	432.00	432.21	431.92	431.46
11.....	431.50	431.35	430.50	431.35	431.40	431.50	431.60	431.50	431.90	432.25	432.35	431.30
12.....	431.40	431.30	430.50	431.30	431.45	431.60	431.60	431.50	431.70	432.90	432.15	430.95
13.....	431.40	431.30	430.60	429.90	431.40	432.00	431.60	431.55	431.70	432.34	432.14	431.10
14.....	431.35	431.20	430.50	431.20	431.20	432.00	431.65	431.55	431.70	432.20	431.90	431.05
15.....	431.35	431.20	431.55	431.50	431.30	432.10	431.65	431.90	431.65	432.05	431.85	430.95
16.....	431.35	431.10	431.40	431.30	431.30	431.80	431.70	431.85	432.00	432.01	431.80	431.20
17.....	431.35	431.10	431.30	431.05	431.45	431.75	431.60	431.70	432.00	432.50	431.93	431.12
18.....	431.30	430.30	431.40	431.20	431.50	431.70	431.60	431.55	432.00	432.05	431.92	431.06
19.....	431.25	430.50	431.50	431.40	431.60	431.65	431.60	431.55	431.85	431.91	431.81	431.65
20.....	431.00	430.50	431.70	431.40	431.60	431.60	431.60	431.55	431.80	431.86	431.75	431.25
21.....	431.00	430.50	431.50	431.35	431.60	431.60	431.65	431.60	431.75	431.91	431.75	431.15
22.....	431.00	430.50	431.30	431.35	431.70	431.70	431.70	431.55	431.75	431.81	431.74	431.00
23.....	429.90	430.50	431.50	431.30	431.50	431.70	431.85	431.55	431.70	431.78	432.55	431.02
24.....	429.80	430.55	431.40	431.35	431.45	431.90	431.80	431.55	431.70	431.81	432.36	430.97
25.....	429.80	430.80	431.30	431.40	431.45	432.00	431.75	431.60	431.70	431.79	432.20	431.05
26.....	429.80	431.10	431.30	431.50	431.45	431.80	431.75	431.60	431.65	431.77	432.03	431.05
27.....	429.80	430.85	431.30	431.50	431.40	431.70	431.70	431.60	431.65	431.86	431.97	431.05
28.....	430.75	430.80	431.35	431.40	431.35	431.70	431.65	431.55	431.80	431.95	431.86	431.07
29.....	430.70	430.90	431.30	431.45	431.40	431.70	431.70	.....	431.80	432.00	431.81	430.95
30.....	430.60	430.80	431.30	431.50	431.40	431.85	431.65	.....	431.70	431.80	431.75	430.90
31.....	431.10	430.80	.....	431.75	.....	432.00	431.60	.....	431.70	.....	.....	.....

LIMESTONE FEEDER AT FAYETTEVILLE

Gage No. 193

This station, established August 27, 1905, is located at the head of the Limestone feeder at Fayetteville.

The record is of the water-surface below the gates supplying the feeder for Limestone creek. Elevations were obtained by use of a reference point until August 23, 1916, when a standard Type A gage, No. 193, was erected on the east end of the north abutment of the bridge over the feeder at the dam. This gage has a range of 8 feet, between elevations 426.0 and 434.0 (B. C. datum).

The gage is read once daily—at noon—to half-tenths.

Daily elevation of water-surface (B. C. datum) of LIMESTONE FEEDER AT FAYETTEVILLE, for the year ended June 30, 1919. D. R. Burhans, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	429.3	429.2	429.15	429.2	429.0	429.1	.....	.....	.....	.....	429.25	
2.....	429.3	429.2	429.15	429.3	429.0	429.1	.....	.....	.....	.....	429.2	
3.....	429.3	429.2	429.15	429.35	429.3	429.0	.....	.....	.....	.....	429.2	
4.....	429.2	429.2	429.1	429.25	429.25	429.0	.....	.....	.....	.....	429.15	
5.....	429.2	429.25	429.0	429.15	429.2	429.0	.....	.....	.....	427.2	429.1	
6.....	429.2	429.25	429.1	429.2	429.1	429.0	.....	.....	.....	427.8	429.1	
7.....	429.2	429.25	429.2	429.25	429.1	428.9	.....	.....	.....	428.15	429.15	
8.....	429.2	429.25	429.1	429.3	429.0	428.9	.....	.....	.....	428.35	429.1	
9.....	429.25	429.25	428.95	429.3	429.0	428.7	.....	.....	.....	428.6	429.1	
10.....	429.25	429.25	429.0	429.35	429.0	428.4	.....	.....	.....	428.95	429.0	
11.....	429.3	429.25	429.0	429.3	429.1	427.2	.....	.....	.....	429.35	428.95	
12.....	429.3	429.2	429.0	429.3	429.25	.....	.....	.....	.....	428.7	428.95	
13.....	429.3	429.15	428.95	429.25	429.3	.....	.....	.....	.....	428.3	429.0	
14.....	429.25	429.1	429.0	429.3	429.2	.....	.....	.....	.....	428.7	429.0	
15.....	429.25	429.1	429.0	429.35	429.3	.....	.....	.....	.....	429.15	429.0	
16.....	429.3	429.1	429.1	429.3	429.4	.....	.....	.....	.....	429.3	429.0	
17.....	429.3	429.1	429.2	429.3	429.3	.....	.....	.....	.....	429.2	429.0	
18.....	429.25	429.0	429.25	429.3	429.3	.....	.....	.....	.....	429.3	429.0	
19.....	429.15	428.9	429.2	429.3	429.3	.....	.....	.....	.....	429.25	428.9	
20.....	429.1	428.8	429.2	429.3	429.25	.....	.....	.....	.....	429.25	429.9	
21.....	429.0	428.8	429.2	429.3	429.2	.....	.....	.....	.....	429.3	429.05	
22.....	429.0	428.8	429.1	429.25	429.2	.....	.....	.....	.....	429.3	429.1	
23.....	429.0	428.75	429.15	429.3	429.2	.....	.....	.....	.....	429.45	429.05	
24.....	429.0	428.7	429.2	429.3	429.0	.....	.....	.....	.....	429.4	429.15	
25.....	429.0	428.8	429.2	429.3	429.1	.....	.....	.....	.....	429.4	429.0	
26.....	429.0	428.9	429.25	429.3	429.2	.....	.....	.....	.....	429.3	429.0	
27.....	429.0	428.8	429.2	429.3	429.3	.....	.....	.....	.....	429.3	429.1	
28.....	429.1	429.0	429.15	429.25	429.2	.....	.....	.....	.....	429.3	429.2	
29.....	429.1	429.1	429.1	429.2	429.2	.....	.....	.....	.....	429.25	429.3	
30.....	429.2	429.2	429.1	429.2	429.1	.....	.....	.....	.....	429.15	429.25	
31.....	429.2	429.15	.....	429.1	.....	.....	.....	.....	.....	429.2	.....

NOTE.—Water below gage, feeder drawn, December 12 to May 4.

BLACK RIVER DRAINAGE BASIN**BLACK RIVER****DESCRIPTION**

Black river rises in the western part of Hamilton county, flows southwestward across Herkimer county into Oneida county, turns near Forestport and runs somewhat west of north through Lewis county to eastern Jefferson county and then flows westward to Black River bay, at the eastern extremity of Lake Ontario. Its total drainage area is 1,930 square miles. The upper part of the basin is very rugged and mountainous, contains a large number of lakes and is in a part of the Adirondack forest.

The mean annual precipitation is about 40 inches, ranging from 55 inches in the extreme headwaters to perhaps 30 inches near Lake Ontario. The winters are generally quite severe and the stream flow is affected by ice for periods of several months.

The regimen of the river is controlled by storage on its upper tributaries (including Beaver river at Beaver River), a series of reservoirs on the headwaters of Moose river and additional reservoirs at Forestport and on the headwaters of the main river.

Water is diverted from Black river through Forestport feeder to supply the Black River canal at Boonville. A portion of this diverted water flows northward from Boonville and enters Black river again at Lyons Falls; the remainder flows southward through the Black River canal and enters the Erie canal at Rome.

BLACK RIVER NEAR BOONVILLE

Location.—At highway bridge about 1 mile above the mouth of Sugar river, about 2 miles northeast of Boonville, Oneida county, and 2 miles, by river, downstream from Hawkinsville.

Drainage area.—503 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—February 16, 1911, to June 30, 1919.

Gage.—Chain, near center of left span, downstream side of bridge. Staff gage, on right abutment, used for high-water readings; read by W. D. Charbonneau.

Discharge measurements.—Made from a cable about $\frac{1}{2}$ mile above gage at high stages and by wading near the cable at low stages.

Channel and control.—Rough and full of boulders; permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 10.2 feet at 8 A. M., April 13; discharge, 5,810 second-feet. Minimum stage recorded, 2.40 feet at 5 P. M., August 26; discharge, 4 second-feet.

1911–1919: Maximum stage, about 12.5 feet during night of March 28, 1913, determined by leveling from flood-mark; discharge, about 10,000 second-feet. Minimum stage recorded, 2.40 feet at 5 P. M., August 26, 1918; discharge, 4 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation and diversion.—The State dam at Forestport, about 8 miles upstream, provides a reservoir with a capacity of about 2,000,000,000 cubic feet. Water is diverted from this reservoir during the navigation season through the Forestport feeder, flowing west to a basin in Boonville. The Black River canal flows north from this basin, entering the Black river at the foot of Lyons falls. A spillway from the basin overflows into Mill creek, a tributary to Black river. Water flowing through these two channels returns to the river below the gaging station, thus passing around it. The Black River canal also flows south from Boonville, passing out of the Black river basin and entering the summit level of the Erie canal (or Barge canal) at Rome.

Occasional discharge measurements have been made at three points, to indicate the distribution of the diverted water. The water entering Boonville through the Forestport feeder has been measured at the highway bridge, about a mile northeast of Boonville. During October, 1915, two water-stage recorders were installed on this canal to obtain a continuous record of the flow. This record is published as a separate station, "Forestport feeder near Boonville." The water flowing north from the basin through the Black River canal has been measured at the highway bridge just below the lock into this canal near the railroad station. The water flowing south from the basin has been measured at a private

farm bridge about a mile southeast of Boonville. During September, 1915, two water-stage recorders were installed on this canal, to obtain a continuous record of the flow, which is published as a separate station, called "Black River canal, flowing south, near Boonville."

Accuracy.— Stage-discharge relation permanent, but affected by ice during a large part of the period, December to March. Rating curve well defined between 35 and 2,800 second-feet and fairly well defined between 2,800 and 4,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good, except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Coöperation.— Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of BLACK RIVER NEAR BOONVILLE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 7.....	M. H. Carson.....	5.49	608
June 7.....	M. H. Carson.....	3.50	66.8
June 8.....	M. H. Carson.....	3.44	61.4

Daily discharge, in second-feet, of BLACK RIVER NEAR BOONVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	194	28	119	305	2,270	512	630	490	855	1,140	735	320
2.....	250	42	90	335	2,160	535	795	450	795	1,460	920	227
3.....	216	46	66	352	1,640	605	1,370	430	795	1,210	1,140	184
4.....	205	49	72	335	1,140	580	1,640	410	680	1,140	1,370	84
5.....	154	49	90	470	680	535	1,060	410	630	920	1,460	42
6.....	63	44	70	680	630	535	580	335	490	1,060	1,640	38
7.....	66	36	174	920	535	660	605	335	490	1,370	1,740	31
8.....	154	24	227	1,060	558	630	630	320	735	1,740	2,050	33
9.....	558	28	194	920	580	735	580	335	1,140	1,740	1,740	36
10.....	855	56	184	855	490	735	605	305	1,140	1,740	1,540	28
11.....	795	84	227	795	390	735	535	335	1,290	2,160	1,290	33
12.....	535	70	275	795	512	795	470	410	1,060	3,880	990	41
13.....	174	56	305	605	605	855	430	450	630	5,520	855	53
14.....	145	61	410	490	580	855	430	795	490	4,960	735	49
15.....	535	46	535	238	580	920	450	990	535	4,280	795	49
16.....	430	44	450	184	558	1,060	450	920	1,210	3,490	680	46
17.....	262	49	410	145	558	920	470	735	2,160	2,620	680	46
18.....	205	59	680	119	430	855	470	580	1,940	1,940	795	66
19.....	154	70	795	164	470	920	430	450	1,460	1,370	1,060	59
20.....	127	59	990	275	680	855	430	390	1,460	1,140	1,060	46
21.....	104	46	1,140	735	630	920	512	335	1,140	1,060	680	51
22.....	111	33	855	795	490	795	535	335	795	920	680	66
23.....	63	27	795	580	450	1,940	580	352	990	920	535	59
24.....	66	21	795	535	335	2,620	512	335	1,290	795	490	49
25.....	49	11	735	630	194	2,270	490	335	1,060	795	558	71
26.....	30	7	795	855	630	1,940	450	370	920	795	580	97
27.....	40	10	795	990	990	1,460	535	535	855	795	680	72
28.....	44	26	735	795	490	1,290	580	680	855	795	605	66
29.....	49	53	680	680	262	1,060	630	.....	680	680	580	63
30.....	30	70	605	990	290	735	680	.....	680	680	580	56
31.....	36	84	.....	1,940	.....	580	558	.....	735	.....	535	.....
Mean...	216	44.8	476	631	604	981	617	469	967	1,770	961	72

NOTE.— Stage discharge relation not affected by ice.

Monthly discharge of BLACK RIVER NEAR BOONVILLE, for the year ended June 30, 1919
[Drainage area, 303 square miles.]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	855	30	216	0.713	0.83
August.....	84	7	44.8	0.148	0.17
September.....	1,140	66	476	1.57	1.75
October.....	1,940	119	631	2.06	2.40
November.....	2,270	194	694	2.29	2.56
December.....	2,620	512	981	3.24	3.74
January.....	1,640	430	617	2.04	2.35
February.....	990	305	469	1.55	1.61
March.....	2,160	490	967	3.19	3.66
April.....	5,520	680	1,770	5.89	6.52
May.....	2,050	490	961	3.17	3.66
June.....	320	28	72	0.238	0.27
The year.....	5,520	7	658	2.17	29.53

FORESTPORT FEEDER NEAR BOONVILLE

Location.—Slope station at lower end of feeder, above point where it enters the basin at Boonville, Oneida county.

Records available.—Occasional discharge measurements, 1900 and 1905 to 1915; continuous record, October 30, 1915, to June 30, 1919. Data published also in annual reports of New York State Engineer and Surveyor and New York State Conservation Commission.

Gages.—Two Gurley 7-day graph water-stage recorders, with natural scale for gage heights. Gage No. 1 is at downstream end of left abutment of steel highway bridge in village of Hawkinsville. Gage No. 2 is on left bank, just below a farm bridge, about a mile above the basin at Boonville. They are 2.53 miles apart. The float wells are $1\frac{1}{2}$ by 2 feet, inside dimensions, and the bottoms are about $1\frac{1}{2}$ feet below normal elevation of water-surface in canal. These gages and the two in the Black River canal (flowing south) near Boonville are all set at the same datum. Recorders inspected by Charles Nugent.

Discharge measurements.—Made from the steel highway bridge at gage No. 1 in Hawkinsville.

Determination of discharge.—Daily discharge determined by use of Chezy formula. The coefficient, "*c*," is computed from each current-meter measurement and is plotted on a curve showing the variation of "*c*" through the season. A smooth curve drawn through the plotted points shows the coefficients for intervening days. The other factors in the Chezy formula are obtained from gage-height records and cross-section of the canal.

Ice.—There is usually no flow in the canal during the winter season. Water was observed in the canal several times during the winters of 1917–1918 and 1918–1919 and occasional current-meter measurements of the discharge were made. See list of measurements.

Diversions.—One spillway takes water from the Forestport feeder just below gage No. 2 and a second spillway takes water from the basin in Boonville. Both discharge into Mill creek,

which enters Black river below the Boonville gaging station. No spillway between gage No. 1 and gage No. 2. Other spillways in the feeder above gage No. 1 discharge into Black river above the gaging station. Therefore, this station indicates the total amount of water diverted past the gaging station on Black river near Boonville, and the sum of this record and the record for the Black river near Boonville indicates the total run-off of the Black river basin above these gaging stations.

Regulation.—Flow in the feeder is regulated at the outlet of Forestport reservoir.

Accuracy.—Records good except for days on which discharge varies widely from the mean, for which they are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of FORESTPORT FEEDER NEAR BOONVILLE, during the year ended June 30, 1919

DATE	Made by	GAGE HEIGHT		Dis-charge
		Gage No. 1	Gage No. 2	
1918		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 18.....	J. W. Moulton.....	3.122	1.776	237
July 18.....	J. W. Moulton.....	3.124	1.779	243
Aug. 15.....	C. C. Covert.....	3.044	1.724	201
Sept. 7.....	C. C. Covert.....	3.526	2.005	254
Sept. 20.....	O. W. Hartwell.....	3.627	2.057	291
Oct. 18.....	E. D. Burchard.....	2.961	1.704	215
Oct. 18.....	E. D. Burchard.....	2.964	1.713	216
Nov. 10.....	E. D. Burchard.....	3.242	1.970	258
Nov. 10.....	E. D. Burchard.....	3.248	1.967	259
Dec. 14 <i>a</i>	E. D. Burchard.....	<i>b</i>	<i>b</i>	66.7
1919				
Jan. 7 <i>a</i>	M. H. Carson.....	.....	.....	53
Feb. 18 <i>a</i>	E. D. Burchard.....	.....	.....	53.2
Mar. 9 <i>a</i>	E. D. Burchard.....	.....	.....	57.8
June 6.....	M. H. Carson.....	2.919	1.58	246
June 8.....	M. H. Carson.....	3.020	1.648	257
June 13.....	M. H. Carson.....	2.696	1.587	204
June 27.....	J. W. Moulton.....	3.226	1.916	268

a Measurements made through complete ice cover. *b* Gage above water.

Daily discharge, in second-feet, of FORESTPORT FEEDER NEAR BOONVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	246	238	215	199	205	.....	.....	.....	.....	.....	.....	.....
2.....	292	221	240	217	197	.....	.....	.....	.....	.....	.....	.....
3.....	307	216	229	203	218	.....	.....	.....	.....	.....	.....	.....
4.....	255	207	221	194	216	.....	.....	.....	.....	.....	.....	.....
5.....	254	212	228	192	219	.....	.....	.....	.....	.....	.....	.....
6.....	245	221	239	199	215	.....	.....	.....	.....	.....	.....	.....
7.....	240	222	251	196	211	.....	.....	.....	.....	.....	.....	264
8.....	238	224	237	203	209	.....	.....	.....	.....	.....	.....	248
9.....	252	225	200	208	218	.....	.....	.....	.....	.....	.....	227
10.....	265	233	193	257	255	.....	.....	.....	.....	.....	.....	216
11.....	264	220	206	275	257	.....	.....	.....	.....	.....	.....	213
12.....	240	219	242	254	257	.....	.....	.....	.....	.....	.....	216
13.....	226	220	214	221	257	.....	.....	.....	.....	.....	.....	205
14.....	249	213	209	194	252	.....	.....	.....	.....	.....	.....	204
15.....	257	203	238	194	250	.....	.....	.....	.....	.....	.....	205
16.....	243	197	247	205	248	.....	.....	.....	.....	.....	.....	206
17.....	236	195	243	217	244	.....	.....	.....	.....	.....	.....	233
18.....	238	179	240	222	268	.....	.....	.....	.....	.....	.....	240
19.....	234	220	219	237	256	.....	.....	.....	.....	.....	.....	235
20.....	224	217	260	223	232	.....	.....	.....	.....	.....	.....	231
21.....	215	227	252	235	227	.....	.....	.....	.....	.....	.....	230
22.....	230	227	246	224	222	.....	.....	.....	.....	.....	.....	228
23.....	239	229	243	217	215	.....	.....	.....	.....	.....	.....	241
24.....	226	230	214	215	207	.....	.....	.....	.....	.....	.....	229
25.....	217	222	206	213	194	.....	.....	.....	.....	.....	.....	236
26.....	206	218	206	243	180	.....	.....	.....	.....	.....	.....	263
27.....	223	215	251	245	160	.....	.....	.....	.....	.....	.....	281
28.....	198	209	240	224	140	.....	.....	.....	.....	.....	.....	275
29.....	205	221	213	218	100	.....	.....	.....	.....	.....	.....	267
30.....	208	231	196	228	50	.....	.....	.....	.....	.....	.....	261
31.....	235	238	.....	264	.....	.....	.....	.....	.....	.....	.....	.....
Mean...	239	218	228	236	213	.....	.....	.....	.....	.....	.....	263

NOTE.— Discharge estimated, November 26 to 30, by comparing gage-height records of gage No. 1 and No. 2 and making estimate of probable slope between the gages.

Monthly discharge of FORESTPORT FEEDER NEAR BOONVILLE, for the year ended June 30, 1919

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	307	198	239
August.....	238	179	218
September.....	260	193	228
October.....	275	192	236
November.....	268	.....	213
December.....	.....	.....	.....
January.....	.....	.....	.....
February.....	.....	.....	.....
March.....	.....	.....	.....
April.....	.....	.....	.....
May.....	.....	.....	.....
June.....	281	204	236

NOTE.— Canal closed November 25, 1918.

BLACK RIVER CANAL, FLOWING SOUTH, NEAR BOONVILLE

Location.—Slope station in summit level of Black River canal near Boonville, Oneida county.

Records available.—Occasional discharge measurements, 1900 and 1905 to 1915. Continuous record, September 16, 1915, to June 30, 1919.

Gages.—Seven-day graph water-stage recorders with natural scale for gage heights. They are 1.81 miles apart. These gages and the two gages in the Forestport feeder near Boonville are all set at the same datum.

Gage No. 1 is located on the right bank (opposite tow-path) about 50 feet downstream from the collector's office in Boonville.

Gage No. 2 is located on the right bank (opposite tow-path) about 300 yards above lock 70 and 50 yards above the spillway from the canal into Lansingkill. Recorders inspected by Charles Nugent.

Discharge measurements.—Made from the steel and concrete highway bridge in the village of Boonville, a short distance below gage No. 1.

Determination of discharge.—Daily discharge determined by use of Chezy formula. The coefficient, "*c*," is computed from each current-meter measurement and plotted on a curve showing the variation of "*c*" through the season. A smooth curve drawn through the plotted points shows the coefficients for intervening days. The other factors in the Chezy formula are obtained from gage-height records and cross-section of canal.

Ice.—There is no flow in the canal during the frozen season.

Diversions.—There are no diversions between gage No. 1 and gage No. 2. This station indicates the amount of water diverted from the Black river into the Mohawk river drainage for canal purposes.

Regulation.—Flow in the canal is regulated by the operation of the spillway and sluice-gates at lock 70 and also by discharge of Forestport feeder into the basin at Boonville.

Accuracy.—Records good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of BLACK RIVER CANAL, FLOWING SOUTH, NEAR BOONVILLE,
during the year ended June 30, 1919

DATE	Made by	GAGE HEIGHT		Dis- charge
		Gage No. 1	Gage No. 2	
1918		<i>Fect</i>	<i>Fect</i>	<i>Sec.-ft.</i>
July 18.....	J. W. Moulton.....	1.462	1.262	156
July 18.....	J. W. Moulton.....	1.456	1.255	153
Aug. 16.....	C. C. Covert.....	1.436	1.196	164
Sept. 20.....	O. W. Hartwell.....	1.62	1.25	166
Oct. 16.....	E. D. Burchard.....	1.286	1.059	137
Oct. 16.....	E. D. Burchard.....	1.286	1.062	136
Nov. 10.....	E. D. Burchard.....	1.632	1.404	174
Nov. 10.....	E. D. Burchard.....	1.634	1.403	178
1919				
June 7.....	M. H. Carson.....	1.399	1.144	197
June 13.....	M. H. Carson.....	1.399	1.201	149
June 26.....	J. W. Moulton.....	1.634	1.308	228

Daily discharge, in second-feet, of BLACK RIVER CANAL, FLOWING SOUTH, NEAR
BOONVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	165	159	167	136	149							
2.....	177	163	173	151	151							
3.....	181	153	167	132	162							
4.....	154	166	159	136	158							
5.....	155	165	173	133	156							
6.....	140	150	155	138	155							
7.....	157	153	160	123	153							167
8.....	153	160	161	133	151							172
9.....	157	169	166	127	157							183
10.....	160	168	156	144	175							174
11.....	168	162	153	152	149							152
12.....	140	158	183	150	166							161
13.....	138	164	166	137	160							144
14.....	153	167	158	131	152							154
15.....	166	157	153	133	153							157
16.....	150	155	144	142	155							157
17.....	149	158	160	66	162							183
18.....	145	143	173	62	168							188
19.....	143	162	158	151	165							185
20.....	136	162	166	159	151							177
21.....	133	162	159	155	148							166
22.....	151	162	154	145	137							164
23.....	167	169	144	134	146							181
24.....	162	166	136	144	159							161
25.....	162	169	142	146	105							201
26.....	151	161	132	146	75							227
27.....	165	157	166	135	0							226
28.....	158	160	165	156	0							218
29.....	156	164	143	146	0							205
30.....	149	165	139	147	0							203
31.....	152	172		152								
Mean...	144	161	158	137	131							179

NOTE.— Discharge estimated, November 26 to 30.

Monthly discharge of BLACK RIVER CANAL, FLOWING SOUTH, NEAR BOONVILLE, for the year ended June 30, 1919

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	181	133	154
August.....	172	143	161
September.....	183	132	156
October.....	169	62	137
November.....	175	0	131
December.....			
January.....			
February.....			
March.....			
April.....			
May.....			
June.....	227	144	179

NOTE.—Canal dry, December to May, inclusive

BLACK RIVER NEAR FELTS MILLS

This station, originally established by the United States Geological Survey, August 29, 1902, is now maintained by this Department. During the summer of 1910 the timber dam formerly used was replaced by a masonry dam located a few rods downstream. The wood-pulp mill has been in operation since 1907.

Location.—Near the village of Felts Mills at the dam of the LeFebvre Paper Company, formerly owned by the Black River Traction Company. The dam is 9 miles upstream from Watertown and 7 miles upstream from the old Huntingtonville gaging station, formerly maintained on this stream.

Drainage area.—1,851 square miles.

Records available.—August 29, 1902, to March 31, 1919.

Gages.—The gage above the dam, located on the left bank of the stream about 100 feet upstream from the wheel racks and about the same distance above the crest of the dam, is a vertical enameled steel staff attached securely to the concrete wall, and steps provide access to the gage for reading. Lower gage is an enameled steel staff gage attached to a pile at the tail-race exit.

Discharge measurements.—Discharge over the spillway is calculated by means of the weir formula, using coefficients derived from experiments of the United States Geological Survey for a dam of similar cross-section. Discharge through the wheels is based on ratings furnished by the Paper Company.

Control.—Dam crest and power-wheels. The main crest of the dam is 300.45 feet long and 3.75 feet in width with a slope on the downstream face of about 1 on 1. There are two wings, one about 47 feet long and about 2.7 feet higher than the main crest, the other about 140 feet long and about 3 feet higher than the main crest. Flash-boards are used on the main crest. The mill contains four 72-in. and one 45-in. Smith turbines. A record is kept of the hours run, gate opening and head on each wheel.

Extremes of discharge.—Current year: Maximum stage recorded, March 20 and 21, 9,900 second-feet. Minimum stage recorded, July 28, 908 second-feet.

1902-1919: Maximum stage recorded, March 28, 1913, at 5 P. M., estimated as 32,500 second-feet. Minimum stage recorded, August 6, 1907, 10 second-feet, due to artificial interruption of flow to fill pond at Herring.

Daily discharge, in second-feet, of BLACK RIVER NEAR FELTS MILLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1.....	1,940	1,540	*680	2,640	6,580	3,500	3,620	1,980	2,440
2.....	1,810	1,380	1,030	2,410	7,100	3,290	5,620	2,370	3,420
3.....	3,870	1,200	1,520	2,300	7,100	3,400	5,310	2,160	4,770
4.....	3,110	1,190	1,270	2,410	6,920	3,730	4,480	2,220	5,040
5.....	2,820	1,060	1,270	2,640	5,910	3,400	4,470	2,210	5,350
6.....	2,120	1,110	1,190	3,710	5,260	2,830	4,060	2,210	4,760
7.....	1,680	1,300	1,190	5,110	4,510	2,580	3,470	2,050	4,750
8.....	1,690	1,200	1,190	5,780	4,100	2,740	3,930	2,500	4,770
9.....	1,860	1,300	1,190	5,110	4,110	3,210	3,570	1,970	4,900
10.....	2,180	1,250	1,030	4,460	3,840	3,710	3,220	1,830	5,640
11.....	1,980	1,290	1,430	3,570	3,350	3,280	3,010	1,620	5,960
12.....	2,160	1,300	1,270	1,890	3,350	3,100	2,740	1,900	6,110
13.....	2,650	1,140	1,270	2,520	3,220	3,090	1,990	1,910	6,270
14.....	2,830	1,240	1,110	2,410	3,000	3,830	2,770	2,220	6,100
15.....	3,110	1,240	1,270	3,160	3,000	6,980	2,790	2,920	5,650
16.....	2,940	1,240	1,430	2,900	3,000	7,240	2,710	2,740	5,350
17.....	3,200	1,100	1,430	2,640	3,000	7,600	2,640	2,760	5,360
18.....	3,030	1,050	3,160	2,410	4,370	6,910	2,490	3,210	8,360
19.....	2,770	1,020	3,860	2,410	6,780	5,320	2,760	2,920	9,500
20.....	2,690	925	4,460	2,410	6,580	4,610	2,600	2,670	8,900
21.....	2,170	979	5,270	2,520	6,270	4,090	2,680	2,280	9,900
22.....	1,780	1,100	4,940	4,010	5,790	3,740	2,200	2,280	9,500
23.....	1,680	1,100	4,310	4,010	5,190	5,480	2,580	2,280	9,100
24.....	1,680	1,100	4,010	3,570	4,350	6,320	3,720	2,280	8,730
25.....	1,500		4,010	1,700	3,510	4,460	4,610	2,610	8,350
26.....	1,290		3,710	3,290	3,610	5,040	2,530	7,800	
27.....	1,160		3,430	4,460	3,210	7,240	5,190	2,440	7,270
28.....	908	*7.850	3,710	4,690	3,110	6,450	4,750	2,290	7,270
29.....	1,400		3,290	4,490	3,020	5,330	4,350		7,270
30.....	1,600		2,770	4,640	3,950	3,840	3,740		7,630
31.....	1,240			5,560		3,520	3,210		7,630
Mean.....	2,156	1,17	2,300	3,414	4,570	4,586	3,550	2,310	6,608

* Dam emptied for repairs from August 25 to September 1, inclusive; discharge estimated from records of U. S. G. S. station at Black River.

Monthly discharge of BLACK RIVER NEAR FELTS MILLS, for the year ended June 30, 1919

[Drainage area, 1,851 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,870	908	2,156	1.16	1.34
August.....	.....	.....	1,171	0.633	0.73
September.....	.....	.....	2,390	1.29	1.44
October.....	5,780	1,700	3,414	1.84	2.13
November.....	7,100	3,000	4,570	2.47	2.76
December.....	7,600	2,580	4,586	2.48	2.86
January.....	5,620	1,990	3,559	1.92	2.21
February.....	3,210	1,620	2,320	1.25	1.30
March.....	9,900	2,440	6,608	3.57	4.12

BLACK RIVER AT BLACK RIVER

Location.—About $\frac{1}{4}$ mile below the concrete arch highway bridge and the power-plant of the Northern New York Utilities Company and about $\frac{3}{4}$ mile below the village of Black River, Jefferson county.

Drainage area.—1,870 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—March 2, 1917, to June 30, 1919.

Gage.—Vertical staff, in two sections, spiked to large cedar tree on the left bank about $\frac{1}{4}$ mile below the highway bridge; read by Erwin W. Hart.

Discharge measurements.—Made from a cable about 100 yards above the gage.

Channel and control.—Solid rock.

Extremes of discharge.—Current year: Maximum stage, 12.7 feet at 8:30 A. M. and 6:20 P. M., April 14; discharge, 17,300 second-feet. Minimum stage, 2.8 feet at 7:45 P. M., September 1; discharge, 400 second-feet.

1917–1919: Maximum stage recorded, 13.4 feet from 6 P. M., April 4, to 7 A. M., April 5, 1917; discharge, 19,300 second-feet. Minimum stage recorded, 1.05 feet at 2:45 P. M., July 29, 1917; discharge, about 16 second-feet.

Ice.—Stage-discharge relation usually affected by ice.

Diversions.—Water is diverted from Black river into Forestport feeder at Forestport. A portion of this water returns to the river through various spillways and through the Black River canal (flowing north). The remainder passes out of the drainage basin through the Black River canal (flowing south). The record at the station on the Black River canal (flowing south) at Boonville indicates the amount of this diversion. See also "Regulation and diversion" in description of station on Black river near Boonville.

Regulation.—Seasonal distribution of flow is regulated by Beaver river flow, Fulton Chain lakes, Forestport reservoir and other storage reservoirs in the upper portion of the drainage basin. Some diurnal fluctuation at low stages, due to mills and power-plants above the station.

Accuracy.—Stage-discharge relation fairly permanent. Rating curve well defined between 500 and 18,000 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results good except for days of low discharge, when they may be poor.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of BLACK RIVER AT BLACK RIVER, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
June 8.....	M. H. Carson.....	3.98	1,370
June 9.....	M. H. Carson.....	3.90	1,360

Daily discharge, in second-feet, of BLACK RIVER AT BLACK RIVER, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,470	1,100	680	2,990	7,610	3,250	5,510	2,780	1,900	8,770	5,190	3,830
2.....	1,680	1,100	745	2,860	6,880	2,600	6,180	1,900	2,120	8,180	5,520	3,410
3.....	3,390	1,100	620	2,120	7,610	2,860	6,880	1,470	2,360	7,990	5,520	2,740
4.....	3,250	1,100	950	2,240	6,880	3,390	4,870	1,470	2,860	7,240	6,390	2,620
5.....	2,120	1,020	1,270	2,480	6,350	2,860	3,950	1,570	3,120	7,990	6,030	2,030
6.....	1,900	950	950	2,730	5,190	2,600	2,670	1,680	3,120	7,990	6,570	1,400
7.....	2,120	1,100	810	4,870	4,710	2,240	4,100	1,470	3,670	9,370	6,390	1,790
8.....	1,680	845	712	5,840	3,950	2,360	3,670	1,270	3,810	9,570	6,030	1,680
9.....	2,240	1,100	1,020	5,150	3,670	2,860	3,950	680	3,390	9,780	5,520	1,400
10.....	3,390	950	1,100	4,550	3,120	3,250	4,100	590	4,550	10,200	4,720	1,790
11.....	2,120	1,900	950	3,810	3,390	3,120	2,730	590	6,180	11,100	4,270	1,000
12.....	1,680	1,370	1,100	3,120	3,530	2,730	1,790	950	6,520	12,600	4,120	900
13.....	1,900	950	1,100	2,600	3,670	2,600	1,790	1,470	5,670	14,600	5,850	1,120
14.....	2,360	1,100	1,790	2,360	4,250	3,670	1,900	1,790	5,840	17,300	5,350	900
15.....	3,120	950	810	2,360	4,400	4,100	2,240	1,900	5,190	16,900	4,870	870
16.....	3,670	880	650	2,240	4,100	4,250	2,120	2,360	4,400	16,200	4,570	1,230
17.....	2,990	1,180	560	2,600	3,810	3,950	2,240	2,600	4,550	12,400	4,120	1,310
18.....	2,480	1,670	1,470	2,120	4,870	3,670	2,360	2,600	5,030	10,900	4,870	1,230
19.....	2,600	1,370	3,120	2,240	6,180	3,250	2,120	2,360	10,400	10,200	6,210	1,310
20.....	2,480	950	3,390	2,010	7,240	2,990	2,010	2,240	10,200	9,120	7,120	1,640
21.....	1,900	1,470	4,250	3,670	6,880	2,860	2,240	1,680	10,400	7,900	6,570	900
22.....	1,790	1,100	4,710	4,550	6,520	2,360	1,900	1,470	10,400	7,900	6,750	900
23.....	1,680	1,370	4,400	4,100	4,650	3,390	2,120	1,900	9,780	7,500	7,310	1,120
24.....	1,370	1,680	4,870	3,530	3,250	4,550	3,120	2,240	9,990	7,500	6,390	840
25.....	1,370	1,270	3,670	2,990	3,250	5,670	4,550	2,010	8,770	7,310	6,350	1,040
26.....	1,470	1,180	2,730	3,390	3,390	8,570	4,870	2,120	8,370	6,030	5,190	1,230
27.....	1,270	880	2,480	4,870	3,390	7,990	5,350	1,680	7,990	6,030	4,870	1,310
28.....	810	1,100	3,120	5,510	3,670	7,060	4,550	1,470	8,370	5,350	4,570	2,030
29.....	1,100	1,100	3,530	5,350	3,250	5,840	3,950	.....	8,570	5,350	3,830	1,600
30.....	1,270	1,370	3,390	6,180	3,670	6,180	3,120	.....	8,180	4,870	3,410	1,810
31.....	1,020	950	.....	7,060	.....	5,030	2,860	.....	8,770	.....	3,830	.....
Mean...	2,050	1,160	2,030	3,640	4,770	3,940	3,450	1,720	6,270	9,460	5,400	1,550

Monthly discharge of BLACK RIVER AT BLACK RIVER, for the year ended June 30, 1919
[Drainage area, 1,870 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	3,670	810	2,050	1.10	1.27
August.....	1,900	845	1,160	0.620	0.71
September.....	4,870	560	2,030	1.09	1.23
October.....	7,060	2,010	3,640	1.94	2.24
November.....	7,610	3,120	4,770	2.55	2.84
December.....	8,570	2,240	3,940	2.11	2.43
January.....	6,880	1,790	3,450	1.84	2.12
February.....	2,730	590	1,720	0.920	0.96
March.....	10,400	1,900	6,270	3.35	3.86
April.....	17,300	4,870	9,460	5.06	5.64
May.....	7,310	3,410	5,400	2.89	3.33
June.....	3,830	840	1,550	0.829	0.92
The year.....	17,300	560	3,787	2.03	27.54

MOOSE RIVER

DESCRIPTION

Moose river is tributary to Black river at Lyons Falls, joining Black river just above the head of the fall of about 50 feet. The drainage of Moose river lies chiefly in Hamilton and Herkimer counties and comprises a wild, rugged and little inhabited region, largely forest-covered, but containing also large tracts of cut and burned-over lands and numerous and extensive swamps and lakes. The stream above the gaging station near McKeever comprises three main branches. The south branch is chiefly broad and sluggish. The area tributary to this branch contains extensive swamps and marshes and but few lakes, the most important lakes being the Limekill and Little Moose lakes. The middle branch is substantially a continuous chain of lakes, known as the Fulton Chain, extending from Old Forge a distance of about 15 miles upstream through eight different lakes. The outflow from Fulton Chain is artificially controlled by a State dam at Old Forge. The first to fourth lakes, inclusive, are at elevation 1,706 feet above tide. There is also a dam at the outlet of the sixth lake. Sixth, Seventh and Eighth lakes are at elevations 1,785 to 1,788 feet above tide. The north branch of the stream is made up of a large number of scattered lakes, the most important one being Big Moose lake. The lower course of the north branch is sluggish and tortuous. The drainage basin above McKeever is nearly all shown on the Big Moose, Raquette lakes, Old Forge and West Canada lakes sheets of the United States Geological Survey topographic maps.

MOOSE RIVER AT MOOSE RIVER

Location.—In the village of Moose River, Lewis county, about 3 miles downstream from McKeever, 5 miles below the mouth of South branch of Moose river and nearly 20 miles above the junction of Black and Moose rivers at Lyons Falls.

Drainage area.—370 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—June 5, 1900, to June 30, 1919.

Gage.—Staff in two sections, on the left bank a short distance above the cable; read by H. W. Hoch. The gage datum was lowered 0.17 foot on February 28, 1903, and again 5.00 feet on January 1, 1913.

Discharge measurements.—Made from a cable a short distance below the gage.

Channel and control.—Cobblestones and boulders; fairly permanent. Current smooth; depth comparatively uniform. Ice and logs occasionally jam above the station on a small island.

Extremes of discharge.—Current year: Maximum stage recorded, 14.5 feet, at 8 A. M., April 12; discharge, 10,400 second-feet. Minimum stage recorded, 5.25 feet, at 8 A. M., June 27; discharge, 93 second-feet.

1900–1919: Maximum stage recorded, 16.3 feet, during the afternoon of March 27, 1913, determined by leveling from flood-marks; discharge, about 16,500 second-feet. Minimum stage recorded, 4.94 feet, July 21, 23, 25, 26, and 27, 1913; discharge, about 42 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—A timber dam at McKeever, 3 miles upstream, is used for power and for the regulation of flow during log-driving. Seasonal distribution of flow affected by operation of the State dam at Old Forge. This regulation is indicated by records from station, "Middle Branch of Moose River at Old Forge."

Accuracy.—Stage-discharge relation practically permanent; usually affected by ice for a large part of the period from December to March. Rating curve fairly well defined between 100 and 5,500 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results fairly good except for periods when the discharge is low or the stage-discharge relation is affected by ice, for which they are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

**Discharge measurements of MOOSE RIVER AT MOOSE RIVER, during the year ended
June 30, 1919**

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
Oct. 17.....	E. D. Burchard.....	7.35	850
1919			
Jan. 8 a.....	E. D. Burchard.....	7.15	603
Feb. 19 a.....	E. D. Burchard.....	6.59	472

a Some backwater due to ice.

**Daily discharge, in second-feet, of MOOSE RIVER AT MOOSE RIVER, for the year ended
June 30, 1919**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	389	202	540	715	2,660	580	760	500	1,020	1,590	1,260	670
2.....	1,320	216	500	625	1,910	760	965	460	1,140	1,320	1,260	500
3.....	810	230	422	625	1,590	670	965	500	965	1,320	1,670	441
4.....	715	230	189	760	1,450	670	1,020	422	1,080	1,320	1,320	164
5.....	625	176	352	800	1,320	670	715	422	910	1,380	1,450	422
6.....	404	151	259	1,380	1,200	580	600	404	910	910	1,590	500
7.....	386	151	230	2,460	860	625	650	386	965	2,000	1,450	202
8.....	386	151	422	1,750	965	540	700	422	1,020	2,460	1,320	259
9.....	422	126	422	1,670	965	580	650	422	1,080	2,860	1,200	259
10.....	441	189	259	1,140	860	625	650	422	1,200	3,060	1,020	230
11.....	715	230	176	1,020	715	670	650	422	1,590	3,060	1,020	230
12.....	760	176	336	1,020	760	625	600	441	1,260	9,250	1,140	189
13.....	810	202	386	910	760	580	600	422	1,080	3,620	1,020	176
14.....	860	164	400	1,080	760	540	600	500	965	2,960	910	138
15.....	810	151	441	1,080	670	1,080	550	580	715	2,660	860	202
16.....	670	259	352	910	670	1,910	500	625	810	2,360	760	259
17.....	580	336	860	860	404	1,320	480	580	715	2,270	910	352
18.....	670	320	1,260	810	580	1,140	460	550	1,450	2,270	2,000	352
19.....	625	202	1,260	715	910	1,020	440	500	2,460	1,910	2,000	304
20.....	540	151	1,140	760	1,320	860	440	480	2,180	1,450	1,380	259
21.....	386	164	1,200	1,080	1,080	670	440	420	2,270	1,450	1,260	259
22.....	336	189	1,380	1,200	965	580	422	400	2,460	1,670	1,080	230
23.....	289	289	1,140	1,020	860	1,750	422	420	2,000	1,450	1,260	230
24.....	274	274	1,110	965	625	2,660	1,020	420	2,000	1,320	1,200	189
25.....	259	230	1,080	860	715	1,670	1,380	420	2,180	1,590	1,080	320
26.....	230	259	1,020	965	670	1,260	1,450	440	1,750	1,380	1,200	176
27.....	216	259	1,080	1,140	580	1,260	965	500	2,360	860	1,080	320
28.....	244	259	1,200	1,140	580	1,020	760	670	2,960	1,110	760	540
29.....	230	230	1,140	1,020	670	760	760	.....	3,060	1,260	715	422
30.....	244	259	910	1,320	860	860	580	.....	2,000	1,260	760	189
31.....	274	230	.....	2,460	.....	810	500	.....	1,830	.....	860	.....
Mean...	513	215	719	1,110	964	947	700	470	1,570	2,120	1,190	299

NOTE.— Stage-discharge relation affected by ice, January 6 to 21 and February 18 to 26. Daily discharge for these periods is approximate.

Monthly discharge of MOOSE RIVER AT MOOSE RIVER, for the year ended June 30, 1919
[Drainage area, 370 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,320	216	513	1.39	1.60
August.....	336	128	215	0.581	0.67
September.....	1,280	176	719	1.94	2.16
October.....	2,460	625	1,110	3.00	3.46
November.....	2,060	404	964	2.61	2.91
December.....	2,060	540	947	2.56	2.95
January.....	1,450	422	700	1.89	2.18
February.....	670	400	470	1.27	1.32
March.....	3,060	715	1,570	4.24	4.89
April.....	9,250	860	2,120	5.73	6.39
May.....	2,090	715	1,190	3.22	3.71
June.....	670	138	299	0.808	0.90
The year.....	9,250	126	901	2.44	33.14

MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE

Location.—About 300 feet below the highway bridge and 400 feet below the State dam at Old Forge, Herkimer county.

Drainage area.—51.5 square miles. (Measured on U. S. Geological Survey topographical maps.)

Records available.—November 9, 1911, to June 30, 1919.

Gage.—Vertical staff on left bank, 300 feet below highway bridge. Gage read by Jacob Edick.

Discharge measurements.—Made from highway bridge or by wading near gage.

Channel and control.—Bed near gage composed of stone and gravel. Control is rock ledge about 200 feet below gage, practically permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 4.1 feet, at 8 A. M., April 13; discharge, 557 second-feet. Minimum stage recorded, 1.00 foot several times in August; discharge, 27 second-feet. Minimum stage occurs when the gates of the dam are closed, discharge being due to leakage and discharge through the fish hatchery.

1911-1919: Maximum stage recorded, 6.3 feet, March 28, 1913 (stage-discharge relation affected by backwater from Moose river); discharge computed from records at dam, 760 second-feet. Minimum stage recorded, 1.00 foot several times in August, 1918; discharge, 27 second-feet.

Ice.—Stage-discharge relation not affected by ice.

Regulation.—Flow controlled by dam.

Accuracy.—Stage-discharge relation practically permanent between dates of shift; not affected by ice. Rating curve well defined from 20 to 400 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying to rating table mean daily gage height, weighted on days of changing gates from records of gate opening at dam. Records good except those computed from gate openings at the dam, which are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurement of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 16.....	J. W. Moulton.....	2.76	212

Daily discharge, in second-feet, of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	34	34	104	98	214	116	80	56	70	290	189	31
2.....	25	34	104	98	232	116	80	58	75	280	189	29
3.....	31	28	104	116	232	116	80	60	75	270	189	29
4.....	32	27	104	165	232	116	80	60	75	260	189	29
5.....	33	27	104	181	232	116	80	60	75	260	189	29
6.....	34	27	104	214	232	116	80	60	80	250	189	43
7.....	40	28	104	214	223	116	80	60	86	232	181	40
8.....	42	28	98	241	214	116	80	60	86	220	143	40
9.....	36	29	98	270	214	116	80	60	92	220	65	40
10.....	36	31	98	280	181	116	80	60	110	220	65	40
11.....	43	33	98	260	150	116	60	60	123	220	65	39
12.....	74	32	98	260	150	110	40	60	130	220	49	37
13.....	200	31	98	260	150	98	43	60	130	220	46	36
14.....	223	31	98	250	150	75	45	61	123	220	45	34
15.....	298	32	110	241	150	75	45	63	116	220	40	39
16.....	324	30	98	241	116	75	43	65	104	220	40	39
17.....	272	29	98	241	98	75	43	65	104	220	44	39
18.....	200	29	104	241	104	75	43	65	123	200	49	45
19.....	36	27	104	232	104	75	43	65	130	200	55	48
20.....	42	75	104	232	116	75	43	65	136	200	58	48
21.....	44	173	104	223	123	75	45	65	150	200	54	48
22.....	58	173	104	214	123	75	45	65	165	200	53	45
23.....	63	173	104	206	123	75	45	65	165	200	50	40
24.....	63	173	104	206	116	75	48	65	158	197	48	33
25.....	58	165	98	214	116	80	53	65	158	197	53	32
26.....	58	165	98	214	116	86	53	65	150	197	48	33
27.....	58	165	104	214	116	86	54	65	150	197	50	35
28.....	58	116	98	214	116	86	56	65	150	197	50	39
29.....	58	98	98	214	116	86	56	.....	173	197	50	39
30.....	58	98	98	214	116	86	56	.....	181	189	48	39
31.....	56	98	.....	214	.....	80	56	.....	260	.....	42	.....
Mean...	87.6	72.2	101	216	156	93.5	58.6	62.2	126	220	84.7	37.9

NOTE.—Discharge, July 1 to 12, determined from special rating curves based on discharge measurements, because of logs on the control. Discharge, September 21 to 23 and April 8 to 23, estimated because of logs on the control.

Monthly discharge of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, for the year ended June 30, 1919

[Drainage area, 51.5 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	324	25	87.6	1.70	1.96
August.....	173	27	72.2	1.40	1.61
September.....	110	98	101	1.96	2.19
October.....	280	98	216	4.20	4.84
November.....	232	98	156	3.03	3.38
December.....	116	75	93.5	1.82	2.10
January.....	80	40	58.6	1.14	1.31
February.....	65	56	62.2	1.21	1.26
March.....	260	70	126	2.45	2.82
April.....	290	189	220	4.27	4.76
May.....	189	40	84.7	1.64	1.89
June.....	48	29	37.9	0.736	0.82
The year.....	324	25	110	2.14	28.94

BEAVER RIVER

East pond, at elevation about 1,956 feet, situated in the lake region of northern Hamilton county, may be said to be the headwaters of Beaver river. This pond is connected by a series of lakes, brooks and swamps with Beaver river flow, which is drained by Beaver river proper, all flowing in a general westerly direction. Razorback pond in Herkimer county is probably the highest body of water draining into Beaver river, being at elevation about 2,200.

From East pond to the junction of Beaver and Black rivers, about eight miles above Carthage, there is a total fall of about 1,200 feet in a distance of about 60 miles.

The principal tributary, Twitchell creek, having its source in Twitchell lake, near Big Moose lake, flows in a general north-westerly direction, emptying into Beaver river flow about 3½ miles above the State dam.

BEAVER RIVER AT STATE DAM, NEAR BEAVER RIVER

Location.— At the concrete storage dam, at the outlet of Beaver river flow, about 7½ miles west of Beaver River P. O., Herkimer county, and 7 miles above Beaver lake at Number Four.

Drainage area.—176 miles square. (Measured on U. S. Geological Survey topographical maps.)

Records available.—May 11, 1908, to June 30, 1919.

Gages.—Elevation of water-surface in the reservoir is determined by a staff gage in two sections, on the west corner of the gate-house; read by James Dunbar, gate-tender. The mean elevation of the crest of the spillway is at gage height 16.96 feet.

Prior to September 28, 1913, elevation of water-surface was determined by measuring the distance from the water-surface to a reference point set at the elevation of the crest of the spillway.

Widths of sluice-gate openings determined by measuring on the gate stems the distance they have been raised.

Discharge measurements.—Current-meter measurements made from a temporary foot-bridge at the mouth of the outlet tunnel, below the gates. Discharge over the spillway has not been measured.

Determination of discharge.—Records include the discharge through one or more of four 4-foot circular sluice-gates, when opened, the discharge over the spillway and the discharge through the logway at the west end of the spillway.

The sluice-gates have been rated by current-meter measurements made at different lake elevations, but no measurements have been made of the discharge over the spillway or through the logway. Theoretic coefficients based on the Cornell Experiments* have been used to compute ratings for the spillway and logway.

Regulation.—At ordinary stages the discharge of Beaver river is completely regulated by the operation of the sluice-gates.

Extremes of stage.—Current year: Maximum elevation of water-surface recorded in reservoir, 18.9 feet at 7:15 A. M., April 12. Minimum stage recorded, 9.6 feet at 4:30 P. M., September 14, and 2 P. M., September 15.

1908-1919: Maximum elevation of water-surface in reservoir, 19.46 feet on March 29, 1913. Minimum stage, 2.9 feet on September 29 and October 1, 1913.

Extremes of discharge.—Current year: Maximum daily discharge, 2,700 second-feet on April 12. Minimum discharge, about 4 second-feet March 22, when all gates were closed.

*United States Geological Survey Water Supply paper 200.

1908-1919: Maximum discharge, 3,296 second-feet on May 2, 1911. Minimum discharge, zero during periods when gates were closed and there was no flow over spillway.

Accuracy.—Stage-discharge relation permanent; probably not affected by ice. Rating curves for sluice gates well defined. Lake-gage read to half-tenths once daily. The accuracy of computations depends to a large extent on the care with which the gates were set to the recorded openings. Records fair.

Coöperation.—Gaging station maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Daily gage height, in feet, of BEAVER RIVER AT STATE DAM, NEAR BEAVER RIVER, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	17.35	16.5	11.5	12.0	17.4	17.25	17.3	16.35	13.5	17.8	17.7	17.5
2.....	17.4	16.4	11.35	12.0	17.8	17.25	17.35	16.25	13.5	17.8	17.7	17.5
3.....	17.5	16.2	11.1	12.15	17.8	17.25	17.4	16.15	13.5	17.8	17.7	17.45
4.....	17.45	16.0	11.0	12.3	17.7	17.2	17.35	16.1	13.5	17.85	17.8	17.4
5.....	17.4	15.8	10.85	12.4	17.6	17.2	17.35	16.0	13.55	17.85	17.9	17.4
6.....	17.4	15.6	10.7	12.6	17.6	17.1	17.35	15.9	13.6	17.4	17.9	17.4
7.....	17.4	15.5	10.55	13.5	17.5	17.1	17.25	15.8	13.6	17.6	17.85	17.4
8.....	17.4	15.4	10.4	13.9	17.5	17.1	17.15	15.75	13.55	17.9	17.85	17.35
9.....	17.45	15.2	10.2	14.3	17.4	17.1	17.15	15.7	13.55	18.0	17.8	17.35
10.....	17.45	15.0	10.0	14.3	17.35	17.1	17.15	15.6	13.75	18.0	17.75	17.3
11.....	17.4	14.9	9.9	14.4	17.3	17.1	17.05	15.55	14.0	18.4	17.7	17.3
12.....	17.3	14.8	9.8	14.5	17.2	17.0	17.0	15.4	14.2	18.9	17.7	17.3
13.....	17.3	14.6	9.7	14.8	17.15	17.0	16.95	15.25	14.2	18.7	17.7	17.0
14.....	17.3	14.5	9.6	15.0	17.1	17.0	16.9	15.2	14.35	18.4	17.7	16.8
15.....	17.3	14.3	9.6	15.0	17.1	17.2	16.8	15.15	14.4	18.3	17.65	16.75
16.....	17.3	14.1	9.75	15.0	17.1	17.4	16.75	15.05	14.4	18.25	17.6	16.7
17.....	17.3	13.9	9.8	15.1	17.1	17.55	16.7	15.0	14.4	18.15	17.6	16.5
18.....	17.3	13.7	9.9	15.1	17.2	17.5	16.65	14.9	14.8	18.15	17.8	16.75
19.....	17.25	13.5	10.2	15.1	17.45	17.4	16.6	14.75	15.5	18.05	18.05	16.6
20.....	17.2	13.3	10.5	15.3	17.7	17.3	16.55	14.6	15.9	17.9	18.0	16.45
21.....	17.15	13.2	10.8	15.4	17.7	17.25	16.5	14.5	16.3	17.9	17.9	16.3
22.....	17.1	13.0	11.1	15.6	17.6	17.3	16.4	14.35	16.8	17.9	17.85	16.1
23.....	17.1	12.8	11.3	15.7	17.5	17.4	16.35	14.25	17.4	17.8	17.8	16.0
24.....	17.05	12.6	11.45	15.8	17.45	17.6	16.45	14.05	17.5	17.8	17.8	15.8
25.....	17.0	12.4	11.55	15.9	17.3	17.7	16.45	14.0	17.6	17.8	17.75	15.6
26.....	16.9	12.2	11.6	16.0	17.25	17.7	16.45	13.85	17.8	17.8	17.75	15.6
27.....	16.85	12.1	11.65	16.2	17.2	17.6	16.45	13.7	17.8	17.75	17.7	15.55
28.....	16.85	12.0	11.7	16.3	17.2	17.5	16.45	13.6	18.1	17.7	17.65	15.55
29.....	16.8	11.95	11.8	16.45	17.2	17.5	16.45	.....	18.1	17.7	17.65	15.45
30.....	16.8	11.8	11.9	16.8	17.2	17.4	16.4	.....	18.0	17.7	17.55	15.35
31.....	16.6	11.65	.....	17.0	.....	17.3	16.4	.....	17.9	.....	17.5	.....

Daily discharge, in second-feet, of BEAVER RIVER AT STATE DAM, NEAR BEAVER RIVER, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	173	253	217	222	463	366	394	252	297	646	535	280
2.....	207	252	216	222	809	366	429	251	297	552	535	280
3.....	280	251	213	224	809	366	463	250	297	552	535	244
4.....	244	250	212	225	714	338	429	250	297	854	630	207
5.....	207	249	210	226	624	338	429	250	298	959	728	207
6.....	207	248	208	228	624	293	429	250	298	553	728	207
7.....	207	248	206	235	536	293	366	249	298	917	679	207
8.....	207	247	205	238	536	293	315	249	298	1,260	679	173
9.....	244	246	202	241	463	293	315	249	298	1,270	630	173
10.....	354	245	200	241	429	293	315	248	299	1,140	582	139
11.....	363	244	199	241	394	293	279	248	302	1,710	535	139
12.....	296	244	197	242	338	265	265	303	303	2,700	535	192
13.....	295	243	196	244	315	265	262	309	303	2,410	585	265
14.....	295	242	194	245	293	265	259	309	304	1,730	535	257
15.....	295	241	194	245	293	338	257	309	304	1,390	490	257
16.....	295	240	196	245	293	463	257	309	304	1,330	427	256
17.....	295	238	197	246	293	580	256	308	304	1,310	368	257
18.....	295	237	199	246	338	536	254	307	307	1,310	552	257
19.....	267	235	202	246	500	463	254	307	311	1,090	835	254
20.....	239	233	206	247	714	394	254	306	314	846	777	252
21.....	217	233	210	247	714	366	253	305	183	807	650	251
22.....	195	231	213	248	624	394	252	304	4	807	601	250
23.....	195	229	215	249	536	463	252	303	334	709	552	250
24.....	181	228	216	249	500	624	252	303	503	709	552	249
25.....	167	226	218	250	394	714	252	302	433	709	504	248
26.....	161	224	218	250	366	714	252	301	642	709	504	248
27.....	160	223	218	251	338	624	252	299	749	661	457	248
28.....	160	222	219	251	338	536	252	298	1,110	584	412	248
29.....	160	222	220	252	338	536	252	.....	1,110	535	412	248
30.....	229	220	221	257	338	463	252	.....	990	535	324	246
31.....	254	218	.....	265	.....	394	252	.....	855	.....	280	.....
Mean...	237	237	208	242	475	417	299	282	418	1,040	552	233

Monthly discharge of BEAVER RIVER AT STATE DAM, NEAR BEAVER RIVER, for the year ended June 30, 1919

[Drainage area, 176 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	363	160	237	1.35	1.56
August.....	253	218	237	1.35	1.56
September.....	221	194	208	1.18	1.32
October.....	265	222	242	1.38	1.59
November.....	809	293	475	2.70	3.01
December.....	714	265	417	2.37	2.73
January.....	463	252	299	1.70	1.96
February.....	309	248	282	1.60	1.67
March.....	1,110	4	418	2.38	2.74
April.....	2,700	535	1,040	5.91	6.59
May.....	835	280	552	3.14	3.62
June.....	280	139	233	1.32	1.47
The year.....	2,700	4	387	2.20	29.82

ST. LAWRENCE RIVER DRAINAGE BELOW LAKE ONTARIO OSWEGATCHIE RIVER

DESCRIPTION

Oswegatchie river rises in Cranberry lake and the mountains to the southwest in St. Lawrence and Jefferson counties, whence it flows in a general northerly direction into the St. Lawrence river at Ogdensburg, where its drainage area is 1,609 square miles. The river is formed by the junction of the east branch of Oswegatchie river and the west branch of the Oswegatchie river at Taleville and its main tributary below this point is Indian river, which flows through Black lake. Considerable power is developed along all three of these main tributaries and many of the power sites in the lower reaches of the river have also been developed.

OSWEGATCHIE RIVER NEAR HEUVELTON

Location.— $2\frac{1}{2}$ miles above Heuvelton, St. Lawrence county, 3 miles below Rensselaer Falls and 7 miles above the Indian river (outlet to Black lake).

Drainage area.—961 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—June 23, 1916, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder on the right bank, about $2\frac{1}{2}$ miles above Heuvelton, installed September 16, 1916. Prior to this date gage height was determined by measuring the distance from a reference point to the water-surface. Recorder inspected by George Todd.

Channel and control.—Solid rock.

Extremes of discharge.—Current year: Maximum stage from water-surface recorder, 5.94 feet at 1:30 A. M., March 21; discharge, 7,760 second-feet. Minimum stage from water-stage recorder, 0.95 foot at 4 A. M., August 24; discharge, 340 second-feet.

1916-1919: Maximum stage from water-stage recorder, 7.6 feet from 9 A. M. to 12 A. M., March 30, 1917; discharge, 11,700

second-feet. Minimum stage from water-stage recorder, 0.91 foot at 11 p. m., October 16, 1916; discharge, 320 second-feet.

Ice.—Stage-discharge relation slightly affected by ice.

Regulation.—Some diurnal fluctuation due to mills at Rensselaer Falls and above. Seasonal flow regulated by storage in Cranberry lake.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 400 and 15,000 second-feet. Stage-discharge relation affected by ice during a portion of the period from January to March. The operation of water-stage recorder satisfactory during the year. Daily discharge ascertained by applying mean daily gage height to rating table. Results good except for period when the stage-discharge relation was affected by ice, when results were fairly good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of OSWEGATCHIE RIVER NEAR HEUVELTON, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
Feb. 18.....	E. D. Burchard.....	2.13	1,320
June 12.....	C. C. Covert.....	1.63	846

GAGING OF STREAMS: ST. LAWRENCE DRAINAGE 177

Daily discharge, in second-feet, of OSWEGATCHIE RIVER NEAR HEUVELTON, for the thirteen months ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	800	446	452	1,370	3,530	2,460	2,820	1,460	1,520	2,250	2,620	1,300
2.....	791	426	440	1,260	3,530	2,320	2,820	1,120	2,180	2,530	3,050	1,160
3.....	800	520	404	1,190	3,370	2,250	2,820	947	2,460	2,600	3,130	1,070
4.....	966	510	459	1,080	2,900	2,180	2,990	956	2,600	2,600	3,050	947
5.....	863	495	513	1,100	2,600	1,910	3,050	966	2,900	2,980	3,870	909
6.....	686	490	499	2,690	2,390	1,550	2,460	976	2,750	3,620	4,830	863
7.....	600	490	492	5,100	2,110	1,720	2,040	947	2,390	4,470	4,920	1,090
8.....	555	400	485	6,050	1,980	1,720	1,750	836	2,110	5,290	4,650	1,490
9.....	562	440	492	6,050	1,840	1,800	1,720	719	1,910	5,480	4,040	1,120
10.....	728	541	472	5,100	1,650	1,900	2,040	696	2,320	5,670	3,450	1,110
11.....	881	719	520	4,120	1,590	1,800	1,980	755	3,210	5,860	2,980	966
12.....	947	863	492	3,290	1,510	1,780	1,780	646	3,370	6,450	2,750	827
13.....	938	800	446	2,600	1,390	1,780	1,410	622	3,050	7,050	2,600	755
14.....	854	622	446	2,110	1,370	2,580	1,200	740	2,750	7,470	2,460	654
15.....	800	555	420	1,910	1,310	4,720	1,260	1,850	2,600	7,260	2,180	638
16.....	719	555	459	1,780	1,280	6,050	1,290	2,040	2,180	7,050	2,040	622
17.....	615	541	472	1,540	1,190	6,250	1,270	1,510	3,730	6,850	1,910	646
18.....	615	520	534	1,430	1,630	5,860	1,270	1,300	6,250	7,050	2,110	670
19.....	600	435	555	1,320	3,390	4,740	1,260	1,200	7,260	6,450	2,320	615
20.....	622	466	938	1,290	4,920	3,780	1,100	1,100	7,470	5,480	2,320	570
21.....	593	492	1,170	1,410	5,670	3,050	1,020	985	7,260	4,650	2,980	592
22.....	555	459	1,420	1,680	5,860	2,600	1,040	938	5,860	4,040	2,750	600
23.....	513	398	1,840	1,010	5,670	2,980	1,090	890	4,830	3,370	2,750	555
24.....	507	355	1,730	1,840	4,830	3,210	1,750	1,190	3,960	2,900	2,980	527
25.....	450	398	1,740	1,750	3,960	2,980	2,490	1,280	3,210	2,600	2,750	562
26.....	433	420	1,780	1,780	3,130	2,750	2,250	1,270	2,820	2,460	2,530	600
27.....	440	392	1,980	2,180	2,600	2,680	2,040	1,220	2,600	2,390	2,390	4,120
28.....	420	420	1,840	2,460	2,180	2,180	1,980	1,070	2,600	2,250	2,180	5,670
29.....	443	443	1,590	2,320	2,180	2,180	1,780	.....	2,690	2,390	1,910	5,100
30.....	453	443	1,510	2,180	2,460	2,110	1,630	.....	2,250	2,680	1,660	3,870
31.....	485	422	.....	2,680	.....	2,600	1,410	.....	2,040	.....	1,470	.....
Mean...	663	502	886	2,400	2,800	2,850	1,830	1,090	3,390	4,470	2,810	1,340

NOTE.—Discharge, August 4 to 9, estimated by study of gage-height graph. Discharge, January 1 to 3, estimated by comparing with hydrograph of sum of East branch of Oswegatchie, Newton Falls, and West branch at Harrisville.

Monthly discharge of OSWEGATCHIE RIVER NEAR HEUVELTON, for the year ended June 30, 1919

[Drainage area, 961 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	966	420	653	0.679	0.78
August.....	863	355	502	0.522	0.60
September.....	1,980	414	886	0.922	1.03
October.....	6,050	1,010	2,400	2.50	2.88
November.....	5,860	1,110	2,800	2.91	3.25
December.....	6,250	1,550	2,850	2.97	3.42
January.....	3,050	1,020	1,830	1.90	2.19
February.....	2,040	622	1,040	1.12	1.17
March.....	7,470	1,520	3,300	3.53	4.07
April.....	7,470	2,250	4,470	4.65	5.19
May.....	4,920	1,410	2,810	2.92	3.37
June.....	5,670	52	1,340	1.39	1.55
The year.....	4,470	355	2,084	2.17	29.50

EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS

Location.—600 feet above the lower dam of the Newton Falls Paper Company in the village of Newton Falls, St. Lawrence county, 4 miles above the mouth of Little river and 10 below the outlet of Cranberry lake.

Drainage area.—166 square miles. (Measured by engineers of the New York State Conservation Commission.)

Records available.—October 6, 1912, to June 30, 1919.

Gage.—Vertical staff on left bank about 600 feet above the lower dam; read by Henry Van Waldick.

Discharge measurements.—Made by wading at low stages and from a cable 30 feet above gage at high stages.

Channel and control.—Small boulders and rock, covered with waste from the pulp-mill; probably permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 5.23 feet at 6:20 p. m., April 13; discharge, 1,630 second-feet. Minimum stage is reached nearly every Sunday during low-water period, when paper mills shut down.

1912-1919. Maximum stage recorded, 6.1 feet at 5:15 p. m., March 28, 1913; discharge, 2,200 second-feet.

Ice.—Stage-discharge relation affected by ice only for short period during extremely cold weather.

Regulation.—Some diurnal fluctuation in flow caused by the paper-mills. Seasonal flow largely controlled by storage at Cranberry lake.

Accuracy.—Stage-discharge relation practically permanent. Not affected by ice during year. Rating curve well defined between 20 and 1,200 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying to the rating table weighted mean gage heights based on observer's notes concerning operation of paper-mills. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

GAGING OF STREAMS: ST. LAWRENCE DRAINAGE 179

Discharge measurements of OSWEGATCHIE RIVER AT NEWTON FALLS, during the
year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 17.....	J. W. Moulton.....	2.09	318
July 17.....	J. W. Moulton.....	1.99	296
July 17.....	J. W. Moulton.....	1.98	296
July 17.....	J. W. Moulton.....	1.93	301
1919			
June 9.....	M. H. Carson.....	1.71	252

Daily discharge, in second-feet, of EAST BRANCH OF OSWEGATCHIE RIVER AT NEW-
TON FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	326	304	20	445	338	282	490	315	272	810	588	252
2.....	293	304	338	430	376	430	475	293	272	770	571	144
3.....	20	350	376	460	282	315	460	554	350	894	538	293
4.....	20	326	338	282	402	460	445	304	338	982	350	293
5.....	326	326	338	475	389	460	282	363	350	938	658	326
6.....	20	326	338	852	402	282	445	252	326	658	658	304
7.....	20	293	338	770	430	402	506	293	350	810	694	293
8.....	376	350	130	658	304	57	460	272	293	810	694	272
9.....	262	326	338	506	326	416	460	293	292	810	732	242
10.....	475	350	376	326	57	430	460	315	389	982	658	272
11.....	293	137	293	293	272	460	522	338	863	1,170	658	293
12.....	376	326	350	252	293	430	252	315	338	1,330	252	315
13.....	350	460	430	315	326	430	538	326	326	1,500	475	326
14.....	20	389	363	326	315	460	363	363	272	1,440	460	272
15.....	304	363	242	338	282	202	363	315	315	1,330	538	103
16.....	304	350	350	363	315	658	445	282	252	1,270	506	272
17.....	315	376	363	252	137	538	445	350	376	1,220	522	416
18.....	282	137	363	272	338	506	252	304	363	1,070	490	293
19.....	272	304	445	282	554	571	338	252	430	1,070	658	262
20.....	262	326	402	338	658	445	430	262	338	938	506	272
21.....	20	326	389	475	571	445	445	262	350	852	402	293
22.....	232	338	326	402	506	57	363	252	272	694	522	232
23.....	282	304	363	445	430	622	376	315	293	588	506	130
24.....	282	363	363	338	262	588	252	304	363	588	658	304
25.....	304	130	282	416	588	588	445	389	293	571	460	326
26.....	272	416	350	363	475	658	338	315	293	588	571	363
27.....	262	376	376	326	419	571	460	272	272	554	554	522
28.....	242	326	338	338	460	622	389	252	242	622	430	460
29.....	252	363	293	338	460	538	402	.....	262	522	460	363
30.....	326	376	522	376	490	694	430	.....	137	554	416	326
31.....	293	338	.....	282	.....	506	315	.....	810	.....	363	.....
Mean...	248	325	338	398	382	456	408	312	329	898	534	294

Monthly discharge of EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS,
for the year ended June 30, 1919
[Drainage area, 186 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	475	20	248	1.49	1.72
August.....	480	130	325	1.96	2.26
September.....	522	20	338	2.04	2.28
October.....	852	252	398	2.40	2.77
November.....	658	57	382	2.30	2.57
December.....	694	57	456	2.75	3.17
January.....	538	252	408	2.46	2.84
February.....	554	252	312	1.88	1.96
March.....	810	137	329	1.98	2.28
April.....	1,500	522	898	5.41	6.04
May.....	732	252	534	3.22	3.71
June.....	522	103	294	1.77	1.98
The year.....	1,500	20	410	2.47	33.58

WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE

Location.—At highway bridge near Geers Corners, $2\frac{1}{2}$ miles downstream from Harrisville, Lewis county.

Drainage area.—245 square miles. (Measured on topographic maps and map of New York issued by U. S. Geological Survey; scale 1:500,000.)

Records available.—July 1, 1916, to June 30, 1919.

Gage.—Vertical staff in three sections on the right bank; one section, graduated from 0.0 to 3.3 feet, about 25 feet below bridge, and two sections, graduated from 3.3 to 10.1 feet, on downstream side of bridge abutment. Gage read by Frank Osborne.

Discharge measurements.—Made from cable 200 feet upstream from bridge or by wading.

Channel and control.—Rocky and rough; probably permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 6.85 feet at 8 A. M., April 13; discharge, 3,360 second-feet. Minimum stage recorded, 1.1 feet at 7 A. M., August 28 and 29; discharge, 42 second-feet.

1916-1919: Maximum stage recorded, 8.1 feet at 6:30 A. M. and 6 P. M., March 28, 1917; discharge, 4,880 second-feet. Minimum stage recorded, 1.1 feet at 6 P. M., August 11, 1917, and 7 A. M., August 28 and 29, 1918; discharge, 42 second-feet.

Ice.—Stage-discharge relation probably not affected by ice.

Regulation.—Operation of pulp mill at Harrisville causes some diurnal fluctuation.

Accuracy.—Stage-discharge relation practically permanent. Not affected by ice. Rating curve well defined between 50 and 4,000 second-feet. Gage read to one-half tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurement of WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919 June 9.....	M. H. Carson.....	Feet 2.04	Sec.-ft. 175

Daily discharge, in second-feet, of WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	220	195	54	422	1,350	650	370	388	440	750	850	335
2.....	440	170	70	405	1,210	580	480	275	700	700	850	275
3.....	370	124	58	303	1,090	520	560	275	700	600	850	275
4.....	245	108	58	305	910	560	560	245	650	650	850	232
5.....	275	108	79	306	750	520	600	305	650	750	970	229
6.....	245	124	91	700	700	520	560	245	650	910	1,210	220
7.....	245	77	74	2,220	560	480	480	220	700	1,210	1,210	170
8.....	220	106	77	2,040	480	480	440	220	600	1,800	1,090	220
9.....	245	195	54	1,560	480	460	405	208	600	2,130	910	182
10.....	370	320	63	1,280	480	520	335	195	800	1,880	750	158
11.....	335	245	66	970	422	480	305	182	850	1,800	700	170
12.....	305	158	56	650	480	440	370	170	910	2,690	700	170
13.....	320	124	70	480	405	440	275	182	800	3,090	650	170
14.....	275	135	70	520	388	600	320	220	850	2,400	650	146
15.....	275	91	68	520	370	1,490	305	370	750	1,960	560	146
16.....	220	66	91	405	335	2,310	305	370	650	1,640	480	106
17.....	195	63	106	405	335	1,880	290	335	970	1,420	480	158
18.....	208	68	275	388	910	1,490	275	320	1,640	1,280	600	182
19.....	195	79	320	305	1,960	1,090	305	305	2,400	1,090	700	135
20.....	170	70	460	275	2,890	850	290	245	2,040	970	650	115
21.....	146	68	750	460	2,490	750	245	275	1,640	910	650	106
22.....	124	68	850	700	1,960	600	245	245	1,350	850	600	146
23.....	106	51	650	650	1,560	750	275	232	1,210	750	560	170
24.....	124	60	700	600	1,150	850	560	245	1,030	650	520	195
25.....	115	58	800	560	910	910	750	245	850	650	440	232
26.....	146	63	800	650	700	850	600	232	800	600	480	158
27.....	146	56	600	850	520	800	520	260	750	600	560	650
28.....	106	56	660	910	480	700	480	290	700	600	520	750
29.....	98	54	560	850	560	600	440	.....	650	750	422	560
30.....	195	58	520	910	700	480	405	.....	650	850	370	405
31.....	245	56	.....	1,150	.....	405	352	.....	750	.....	370	.....
Mean...	228	106	302	734	918	775	409	258	927	1,230	684	239

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE,
for the year ended June 30, 1919
[Drainage area, 245 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	440	98	223	0.910	1.05
August.....	320	51	105	0.429	0.49
September.....	850	54	302	1.23	1.37
October.....	2,220	275	734	3.00	3.45
November.....	2,890	335	918	3.75	4.18
December.....	2,310	405	775	3.16	3.64
January.....	750	245	409	1.67	1.92
February.....	388	170	258	1.05	1.09
March.....	2,400	440	927	3.78	4.36
April.....	3,090	600	1,230	5.02	5.60
May.....	1,210	370	684	2.79	3.22
June.....	750	106	239	0.98	1.09
The year.....	3,090	51	567	2.31	31.47

RAQUETTE RIVER DESCRIPTION

Raquette river rises in northern Hamilton county, flows almost north through a long narrow valley to St. Lawrence river. Its total length from its source to its confluence with the St. Lawrence, near the most northern point of the state, is 162 miles. The drainage area at the mouth of the river is 1,269 square miles.

Its source is on an elevated plateau about 1,600 feet above sea-level. The upper part of the basin includes many acres of swamp land, as well as a large area of lakes and ponds, including Tupper lake, Little Tupper lake, Long lake, Round lake, Blue Mountain lake, Forked lake and Raquette lake.

The high region receives a heavy rainfall, the mean annual amounting to about 48 inches, or about 10 inches above the mean for the state.

The course of the river through the mountains is marked by many falls and rapids, but as yet only 400 feet of the 1,400 feet of fall in the river below Tupper lake has been developed. The river is characterized by tremendous fluctuations between the maximum and minimum flow and is in great need of artificial regulation, if the possibilities of power development are to be fully realized.

RAQUETTE RIVER AT PIERCEFIELD

Location.—One-half mile below the dam of the International Paper Company at Piercefield, St. Lawrence county, and about $\frac{3}{4}$ mile above head of Black rapids.

Drainage area.—723 square miles. (All but 16 square miles measured on U. S. Geological Survey topographic maps.)

Records available.—August 20, 1908, to June 30, 1919.

Gage.—Stevens water-stage recorder in a galvanized sheet-iron house over a concrete well on left bank about $\frac{1}{2}$ mile below dam. Recorder inspected by M. O. Wood.

Discharge measurements.—Made from a cable $\frac{3}{4}$ mile below gage—just above Black rapids.

Channel and control.—Channel opposite gage is a deep pond with no perceptible velocity. Control point is at head of Black rapids.

Extremes of discharge.—Current year: Maximum stage recorded, 9.93 feet at 9 p. m., April 16; discharge, 5,170 second-feet. Minimum stage recorded, 2.2 feet at 3 p. m., September 15; discharge, 94 second-feet.

1908–1919: Maximum stage from water-stage recorder, 11.68 feet at 3 a. m., April 1, 1913; discharge, 7,100 second-feet. Minimum stage from water-stage recorder, 0.85 foot at 11 a. m., September 2, 1913; discharge, about 10 second-feet.

Ice.—Rapids that form control rarely freeze and measurements when the pond was covered with ice indicate that the stage-discharge relation is not often affected.

Regulation.—Large diurnal fluctuation in flow caused by dam during low and medium stages. Numerous lakes in the upper part of the drainage afford considerable storage, most of which is so controlled that the effect on the seasonal distribution of flow is large.

Accuracy.—Stage-discharge relation practically permanent. Not affected by ice. Rating curve well defined between 50 and 7,000 second-feet. Operation of the water-stage recorder satisfactory throughout the year. Daily discharge ascertained by discharge integration. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State

Conservation Commission. Water-stage recorder inspected by an employee of the International Paper Company.

Daily discharge, in second-feet, of RAQUETTE RIVER AT PIERCEFIELD, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	864	865	235	1,280	2,410	1,550	1,690	1,010	620	2,300	3,440	1,910
2.....	1,250	765	259	1,260	2,780	1,920	1,690	409	306	2,380	3,300	2,080
3.....	1,200	740	370	1,240	2,680	1,800	1,690	575	734	2,480	3,160	1,940
4.....	782	485	523	1,190	2,980	1,720	1,660	890	903	2,500	3,290	1,890
5.....	962	565	387	1,160	2,880	1,590	1,210	900	580	2,520	3,400	1,810
6.....	1,270	740	328	1,440	2,880	1,510	1,560	918	633	2,310	3,340	1,700
7.....	824	713	204	2,180	2,780	1,590	1,580	895	800	2,700	3,560	1,590
8.....	964	710	117	2,500	2,590	1,150	1,490	800	791	2,840	3,410	1,260
9.....	1,260	746	273	2,780	2,500	1,520	1,510	327	411	3,060	3,300	1,510
10.....	1,210	677	417	2,900	2,240	1,490	1,490	392	737	3,400	3,240	1,320
11.....	1,260	421	407	2,900	2,410	1,420	1,380	580	990	3,610	2,860	1,210
12.....	1,240	838	408	2,770	2,410	1,390	650	580	868	3,990	2,940	1,200
13.....	1,280	830	408	2,510	2,240	1,360	1,100	545	925	4,300	2,820	1,190
14.....	830	867	385	2,590	2,150	1,360	1,310	598	963	4,600	2,750	1,130
15.....	1,330	862	154	2,430	2,070	898	1,280	750	975	4,900	2,800	568
16.....	1,380	845	278	2,270	1,990	1,390	1,230	416	567	5,010	2,780	854
17.....	1,330	835	458	2,170	1,570	1,460	1,200	648	923	5,030	2,790	937
18.....	1,350	523	414	2,080	1,900	1,490	1,280	755	1,160	5,090	2,710	960
19.....	1,290	775	453	1,940	2,070	1,490	1,240	780	1,230	5,010	2,710	938
20.....	1,380	845	531	1,820	2,070	1,460	545	680	1,260	5,020	2,680	870
21.....	898	785	532	1,860	2,150	1,420	720	560	1,430	4,910	2,670	600
22.....	1,400	710	300	1,840	2,240	960	690	560	1,580	4,820	2,650	378
23.....	1,380	695	401	1,760	2,320	1,490	880	303	1,420	4,670	2,650	452
24.....	1,110	657	614	1,760	1,990	1,440	1,160	600	1,820	4,560	2,610	652
25.....	1,100	277	780	1,660	2,240	1,360	1,180	820	1,950	4,290	2,570	622
26.....	1,110	417	1,070	1,660	2,240	1,800	1,140	640	2,020	4,180	2,680	624
27.....	960	417	1,070	1,590	2,070	1,870	520	598	2,070	4,030	2,590	665
28.....	640	340	1,110	1,720	1,720	1,840	927	627	2,210	3,900	2,530	556
29.....	895	285	950	1,720	2,030	1,460	940	.....	2,220	3,760	2,420	256
30.....	983	205	1,290	1,870	1,990	1,840	1,100	.....	1,980	3,610	2,320	.....
31.....	975	160	.....	2,070	.....	1,760	990	.....	2,240	.....	2,220	.....
Mean...	1,120	632	504	1,970	2,290	1,510	1,190	648	1,210	3,860	2,880	1,070

NOTE.— Daily discharge estimated, because of no gage height record, January 12 and 13.

Monthly discharge of RAQUETTE RIVER AT PIERCEFIELD, for the year ended June 30, 1919

[Drainage area, 723 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,400	640	1,120	1.55	1.79
August.....	867	160	632	0.874	1.01
September.....	1,290	117	504	0.697	0.78
October.....	2,900	1,160	1,970	2.72	3.14
November.....	2,980	1,570	2,290	3.17	3.54
December.....	1,920	896	1,510	2.09	2.41
January.....	1,690	520	1,190	1.60	1.84
February.....	1,010	303	648	0.896	0.93
March.....	2,240	306	1,210	1.67	1.92
April.....	5,090	2,300	3,860	5.34	5.96
May.....	3,560	2,220	2,880	3.98	4.59
June.....	2,080	256	1,070	1.43	1.65
The year.....	5,090	117	1,574	2.18	29.56

ST. REGIS RIVER

DESCRIPTION

St. Regis river has its source in several small streams and lakes in the western part of Franklin county at an elevation of about 1,500 feet above the sea. It first flows in a northwesterly direction for about 40 miles and then somewhat east of north for about 28 miles to its mouth, in the St. Lawrence river near the state line. Its drainage area comprises 664 square miles (State Water Supply Commission).

The upper portion of its watershed consists of swamp and of mountains, from which most of the forest has been cut. Upon leaving the plateau the stream descends for 10 or 15 miles through a rugged country by a succession of steep rapids and precipitous falls to the lowlands bordering the St. Lawrence. Only a few of the excellent opportunities for developing power in the descent have as yet been utilized. From the foot of the hills to the St. Lawrence, the slope of the river is moderate and rock outcrop not frequent, consequently favorable sites for power-plants are scarce.

ST. REGIS RIVER AT BRASHER CENTER

Location.—Near the steel highway bridge in the village of Brasher Center, St. Lawrence county, 5 miles downstream from Brasher Falls, $6\frac{1}{4}$ miles below junction of east and west branches of St. Regis river and about 12 miles above the mouth.

Drainage area.—621 square miles. (Measured on post-route map.)

Records available.—August 22, 1910, to June 30, 1919.

Gages.—Staff, with inclined and vertical sections, on right bank about 600 feet above bridge. Installed June 24, 1916. Gage read by George Myers and Henry Shattuck.

Discharge measurements.—Made from a cable at the staff gage, installed in June, 1916. Previously made from the highway bridge or by wading.

Channel and control.—Small boulders and coarse gravel at cable; fairly permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 9.5 feet at 5 p. m., March 18; discharge, 5,850 second-feet. Mini-

imum stage recorded, 6.10 feet at 6 A. M., June 24, and 6 A. M. and 6 P. M., June 25; discharge, 340 second-feet.

1910-1919: Maximum stage recorded, 9.1 feet at 7 A. M., March 27, 1914; discharge, 16,200 second-feet. Minimum stage recorded, 5.25 feet, August 8, 1917; discharge, 34 second-feet.

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Affected by ice during a large portion of the period from December to March, inclusive. Rating curves well defined between 200 and 6,000 second-feet. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results good except for periods when the stage-discharge relation was affected by ice, when results were fairly good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements at ST. REGIS RIVER AT BRASHER CENTER, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		Feet	Sec.-ft.
Jan. 9 a.....	E. D. Burchard.....	7.83	700
Feb. 17 a.....	E. D. Burchard.....	7.10	700
Mar. 8 a.....	E. D. Burchard.....	7.28	1,250
June 11.....	M. H. Carson.....	6.32	532

a Backwater present, due to ice.

Daily gage height, in feet, of ST. REGIS RIVER AT BRASHER CENTER, for the year ended June 30, 1919

DAY	Jan.	Feb.	Mar.	Apr.	May	June	DAY	Jan.	Feb.	Mar.	Apr.	May	June
1.....	8.7	6.8	6.9	7.5	7.5	6.55	16.....	7.45	7.2	7.2	8.1	6.9	6.38
2.....	8.7	6.75	7.4	7.4	7.45	6.5	17.....	7.2	7.1	7.7	8.5	6.85	6.36
3.....	8.7	6.75	7.5	7.35	7.4	6.42	18.....	7.15	7.15	9.4	8.2	7.1	6.49
4.....	8.7	6.85	7.6	7.3	7.2	6.31	19.....	7.2	7.1	8.4	8.0	7.25	6.44
5.....	8.6	6.95	8.5	7.3	8.0	6.20	20.....	7.1	6.9	8.3	7.8	7.0	6.39
6.....	8.7	6.85	7.6	7.4	8.3	6.22	21.....	6.95	6.9	8.3	7.5	6.95	6.26
7.....	8.7	6.85	7.45	8.4	8.1	6.25	22.....	6.85	6.9	8.1	7.35	6.9	6.21
8.....	8.8	6.8	7.4	8.0	7.8	6.21	23.....	6.95	6.85	8.0	7.45	7.15	6.19
9.....	7.8	6.8	7.35	8.5	7.5	6.34	24.....	7.4	6.9	7.9	7.4	7.5	6.11
10.....	7.8	6.7	7.6	8.4	7.3	6.30	25.....	7.3	6.85	7.7	7.15	7.35	6.10
11.....	8.2	6.65	7.8	8.5	7.4	6.31	26.....	7.4	6.85	7.8	7.2	7.4	6.16
12.....	8.1	6.7	7.7	9.1	7.35	6.28	27.....	7.35	6.8	7.7	7.1	7.25	7.0
13.....	7.7	6.7	7.6	8.9	7.35	6.30	28.....	7.2	6.8	7.8	7.2	7.2	7.35
14.....	8.2	6.8	7.3	8.6	7.05	6.34	29.....	7.1	.....	7.2	7.6	6.85	7.1
15.....	8.0	7.0	7.2	8.2	7.25	6.31	30.....	7.0	.....	7.35	7.6	6.65	6.7
							31.....	6.9	.....	7.35	.....	6.55	.....

GAGING OF STREAMS: ST. LAWRENCE DRAINAGE 187

Daily discharge, in second-feet, of ST. REGIS RIVER AT BRASHER CENTER, for the
year ended June 30, 1919

DAY	Jan.	Feb.	Mar.	Apr.	May	June	DAY	Jan.	Feb.	Mar.	Apr.	May	June
1.....	1,800	480	550	2,030	2,030	758	16.....	1,000	900	1,100	3,000	1,180	586
2.....	1,800	420	1,100	1,880	1,960	705	17.....	900	750	1,800	3,720	1,120	567
3.....	1,800	440	1,400	1,800	1,880	625	18.....	800	800	3,400	3,170	1,450	695
4.....	1,800	500	1,500	1,730	1,590	520	19.....	900	750	3,530	2,830	1,660	645
5.....	1,700	600	1,500	1,730	2,830	420	20.....	750	550	3,350	2,500	1,310	596
6.....	1,800	500	1,500	1,880	3,350	438	21.....	600	550	3,350	2,030	1,240	474
7.....	1,800	500	1,500	3,530	3,000	465	22.....	500	550	3,000	1,800	1,180	429
8.....	2,000	480	1,400	3,920	2,500	429	23.....	600	500	2,830	1,960	1,520	412
9.....	700	460	1,300	3,720	2,030	548	24.....	1,100	600	2,660	1,880	2,030	348
10.....	650	400	1,700	3,530	1,730	510	25.....	1,000	500	2,340	1,520	1,800	340
11.....	650	340	2,000	3,720	1,880	520	26.....	1,200	500	2,500	1,590	1,880	388
12.....	600	380	1,800	4,060	1,800	492	27.....	1,100	460	2,340	1,450	1,660	1,310
13.....	600	400	1,700	4,540	1,800	510	28.....	850	480	2,500	1,590	1,450	1,800
14.....	600	480	1,200	3,920	1,380	548	29.....	750	.....	1,590	2,180	1,120	1,450
15.....	800	650	1,100	3,170	1,660	520	30.....	650	.....	1,800	2,180	870	930
							31.....	600	.....	1,800	.....	758	.....
							Mean...	1,050	533	1,970	2,650	1,730	633

NOTE.—Stage-discharge relation affected by ice, January 1 to March 18.

Monthly discharge of ST. REGIS RIVER AT BRASHER CENTER, for the year ended
June 30, 1919
[Drainage area, 621 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
January.....	2,000	500	1,050	1.69	1.95
February.....	900	340	533	0.858	0.89
March.....	3,530	550	1,970	3.17	3.66
April.....	4,960	1,450	2,650	4.27	4.76
May.....	3,350	758	1,730	2.79	3.22
June.....	1,800	340	633	1.02	1.14

LAKE CHAMPLAIN DRAINAGE BASIN

DESCRIPTION OF BASIN

Lake Champlain occupies a long and narrow valley, extending in a north-south direction and forming a part of the boundary between New York and Vermont.

Drainage areas tributary to LAKE CHAMPLAIN *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
Pike river and adjacent area in Canada.....	.....	a 242.00	.....
Missisquoi river in Canada.....	.....	b 245.00	.....
Land area in Canada above outlet.....	.....	.....	487.00
Missisquoi river in Vermont.....	.....	b 615.00	.....
(Total Missisquoi river, 860 square miles.)	.....	.....	.....
Lamoille river.....	.....	b 725.00	.....
Winooski river.....	.....	b 995.00	.....
Otter creek.....	.....	b 935.00	.....
Eastern coast drainage.....	.....	b 534.40	.....
Mettawee, Poultney and Castleton rivers in Vermont.....	.....	c 376.00	.....
Land area in Vermont, except islands.....	.....	.....	4,180.40
Wood creek above Smith's Basin.....	18.60	.....	.....
Big creek (Washington Co.) above junction with Wood creek.....	35.16	53.76	.....
Wood creek, Smith's Basin to Fort Ann.....	9.90	63.66	.....
Halfway creek above Kane's falls.....	78.82	.....	.....
Halfway creek, Kane's falls to junction with Wood creek at Fort Ann.....	6.69	85.51	.....
Wood creek at Fort Ann, including Halfway creek.....	.....	149.17	.....
Wood creek, Fort Ann to junction with Mettawee.....	55.73	204.90	.....
Mettawee river in Vermont.....	151.90	.....	.....
Mettawee river in New York.....	55.70	.....	.....
Total, Mettawee river.....	.....	207.60	.....
Total, Wood creek and Mettawee river at junction.....	.....	412.50	.....
Wood creek, junction Mettawee river to Whitehall.....	13.65	426.15	.....
Wood creek, Whitehall to junction with Poultney river.....	1.65	427.80	.....
Castleton river, in Vermont.....	100.90	.....	.....
Poultney river, including Castleton river in Vermont.....	.....	254.80	.....
Poultney river in New York.....	.....	11.00	.....
Poultney river, total to junction with Wood creek.....	.....	265.80	.....
Total, Wood creek and Poultney river at junction.....	.....	.....	693.60
Wood creek, Mettawee and Poultney rivers in New York.....	.....	286.90	.....
Lake George outlet.....	.....	220.10	.....
Bouquet river.....	.....	c 268.10	.....
Ausable river.....	.....	d 521.30	.....
Little Ausable river.....	.....	d 75.10	.....
Saranac river.....	.....	d 629.60	.....
Little Chazy river.....	.....	c 63.80	.....
Big Chazy river.....	.....	d 299.40	.....
Western coast drainage.....	.....	d 344.60	.....
Land area in New York, except islands.....	.....	.....	2,708.90
Islands in New York.....	.....	e 55.20	.....
Total land area above outlet.....	.....	.....	7,431.50
Water-surface in Canada.....	.....	e 16.50	.....
Water-surface in United States.....	.....	e 419.10	.....
Total water-surface.....	.....	435.60	.....
Total drainage area above outlet.....	.....	.....	7,867.10
Richelieu river, Rouses Point to Chambly.....	a 310.00	.....	.....
Total drainage area above Chambly.....	.....	.....	8,177.10
Richelieu river, Chambly to mouth.....	a 626.30	.....	.....
Richelieu river, total.....	.....	936.30	.....
Total drainage area above mouth.....	.....	.....	8,803.40

* Table here presented is a revision of that appearing in the 1917 report. a From maps of Canadian Geological Survey. Scale: 1 inch = 4 miles. b United States post-route maps. Scale: 1 inch = 12.5 miles. c Topographic maps of U. S. G. S. Scale: 1 inch = 1 mile (nearly). d Bien's Atlas of New York. Scale: 1 inch = 2.5 miles. e Charts of U. S. Coast and Geodetic Survey. Scale: 1:40,000.

The drainage basin is irregular in form, being about seventy-five miles wide from a point opposite Middlebury, Vt., northward to the outlet of the lake at Rouses Point, on the international boundary. South of Middlebury the average width of the basin is about thirty-five miles and the lake itself is very narrow, forming virtually a drowned river.

The tributary region is rugged and mountainous, mostly covered with forest and with little depth of soil except in the stream valleys. The drainage is received almost entirely through large tributaries, there being little direct coast drainage into the lake. The outlet of the lake is Richelieu river, which flows northward from Rouses Point to St. Lawrence river. The land drainage area above Rouses Point is 7,431 square miles. The water-surface of the lake is 436 square miles, making the total area at the foot of the lake 7,867 square miles.

The fluctuation of the lake surface has an extreme range of nearly ten feet.

LAKE CHAMPLAIN

Records showing the water-surface of Lake Champlain are kept at Fort Montgomery and Burlington by the United States Government and at Whitehall by the State of New York. The Government elevations are referred to mean sea-level at Sandy Hook, while the State elevations, Barge canal datum, are referred to mean tide at New York, which is taken as 14.73 feet below the Greenbush bench-mark. The relation between the two sets of elevations in this region is shown by the following determinations of the elevation of the old bench-mark at Whitehall, described as, "U. S. D. W. B. M., on coping of lock No. 23, between ends of anchor, N. W. gate, marked (cross in circle) U. S., with chisel," which is New York State Canal B. M. No. 130 and United States Coast and Geodetic Survey B. M. No. 36.

	Feet
Elevation (New York State Barge canal datum)	104.375
Elevation (United States Coast and Geodetic Survey datum)	103.565
Difference	0.81

Therefore, to convert elevations in this region given by the United States Coast and Geodetic Survey or by the United States Engineers (War Department), referred to mean sea-level, to elevations referred to Barge canal datum, add 0.81 foot. It is to be noted that the similar relation at Albany is 0.87 foot.

LAKE CHAMPLAIN AT WHITEHALL

Gage No. 126

A gage has been maintained by this Department in the mouth of Wood creek below the dam at Whitehall since January 22, 1905. This gage gives a record of fluctuation in level of water in this arm of Lake Champlain, which, however, is considerably affected by Wood creek discharges.

The original gage was attached to the face of the Champlain silk-mill on the right side of the stream below the dam. A standard Type A gage, No. 126, secured to the upper end of the lower east gate recess and having a range of 4 feet, between elevation 93.0 and 97.0, was superseded on December 20, 1917, by a standard Type A gage, in two sections. The lower section, having a range of 8 feet, between elevations 93.0 and 101.0, is secured to the north face of the lower west approach wall. A standard bench-mark plug is set in the wall near this section at elevation 100.0 (B. C. datum). The upper section, having a range of 4 feet, between elevations 101.0 and 105.0, is secured to the north face of the lower east thrust wall. A standard bench-mark plug is set near this section at elevation 104.0 (B. C. datum).

The gage is read twice daily—morning and afternoon—to tenths, with occasional readings to half-tenths.

This record was published as "Wood creek below Dam at Whitehall" previous to 1914.

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 191

Daily elevation of water-surface (B. C. datum) of LAKE CHAMPLAIN AT WHITEHALL, for the year ended June 30, 1919. W. J. Berry and H. Pfandler, Observers.

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	96.40	95.55	95.12	96.18	98.25	98.50	97.60	96.95	99.10	98.80	99.25	98.40
2.....	96.60	95.20	94.95	95.72	98.45	98.15	97.80	97.00	97.40	98.30	99.20	98.32
3.....	96.55	95.35	94.58	96.25	98.50	98.00	98.00	96.90	96.40	98.15	99.20	98.30
4.....	96.80	95.32	94.55	95.92	98.48	98.25	98.00	96.80	96.25	98.35	99.45	98.10
5.....	96.50	95.25	94.65	96.15	98.85	98.05	97.70	96.80	96.35	98.35	99.45	98.10
6.....	96.30	95.40	94.95	96.80	98.40	98.05	97.70	96.70	96.60	98.35	99.40	97.80
7.....	96.45	95.35	95.20	97.95	97.90	97.85	97.50	96.68	96.42	98.50	99.08	98.00
8.....	96.40	95.50	95.05	97.45	98.55	97.75	97.45	96.60	96.45	98.85	99.62	97.75
9.....	96.22	95.65	95.05	97.38	97.75	97.95	97.40	96.60	96.80	99.30	99.45	97.65
10.....	96.28	95.55	95.30	97.60	98.10	97.95	97.60	96.60	97.30	98.85	99.10	97.65
11.....	96.32	95.10	95.00	97.65	98.22	97.65	97.60	96.60	96.85	98.80	99.20	97.90
12.....	96.38	95.50	94.70	97.48	98.00	97.55	97.40	96.60	96.60	99.75	99.15	97.55
13.....	96.35	95.30	94.75	97.38	97.55	97.50	97.40	96.60	96.90	99.80	98.95	97.45
14.....	96.40	95.55	94.70	97.72	97.85	97.35	97.40	96.60	96.95	100.10	98.90	97.35
15.....	96.20	95.60	94.80	97.75	97.70	97.55	97.30	96.60	96.75	100.20	98.75	97.35
16.....	96.20	95.70	94.65	97.55	97.65	97.85	97.30	96.50	96.55	100.00	98.40	97.28
17.....	96.28	95.70	94.70	97.50	97.65	98.05	97.20	96.45	96.60	100.10	98.50	97.45
18.....	96.32	95.70	94.92	98.08	97.80	98.00	97.10	96.40	96.75	100.15	98.58	97.35
19.....	96.15	95.55	94.80	97.55	98.95	97.75	97.20	96.40	97.05	100.20	98.45	97.20
20.....	96.10	95.42	94.82	96.90	98.85	97.65	97.15	96.35	97.18	99.85	98.55	97.35
21.....	96.00	95.30	95.15	97.08	98.80	97.60	97.05	96.25	97.35	100.55	98.45	97.40
22.....	95.80	95.42	94.60	97.55	98.80	97.55	96.80	96.20	97.75	100.10	98.90	97.60
23.....	95.75	95.22	95.25	97.40	98.72	97.72	96.80	96.15	97.90	99.95	98.90	96.88
24.....	95.72	95.12	95.28	97.38	98.45	97.78	97.70	96.10	98.00	99.60	98.75	96.90
25.....	95.65	95.30	95.20	96.98	98.40	97.95	97.40	96.00	97.60	99.60	98.40	96.65
26.....	95.52	95.12	95.55	97.20	98.85	98.05	97.10	96.00	97.45	99.55	98.90	96.48
27.....	95.35	95.62	96.35	97.25	97.95	97.98	97.00	96.05	97.40	99.60	99.10	96.85
28.....	95.80	94.88	95.45	96.90	98.20	97.95	97.05	96.00	96.45	99.25	98.90	97.30
29.....	95.68	94.65	96.15	96.48	98.15	98.00	97.00	.....	98.70	99.70	98.65	96.68
30.....	95.50	94.95	95.95	97.50	98.18	97.80	97.00	.....	98.65	99.75	98.80	96.60
31.....	95.92	94.75	.....	98.38	.....	97.70	97.00	.....	98.80	.....	98.60	.....

LAKE CHAMPLAIN AT BURLINGTON, VT.

Location.— On south side of roadway leading to dock of Champlain Transportation Co., at foot of King street, Burlington, Vt.

Records available.— May, 1907, to June 30, 1919.

Gage.— Staff; read once daily. Comparisons of gage readings indicate that zero of gage at Burlington is at practically the same elevation as that of gage at Fort Montgomery — 92.50 feet above mean sea-level (Elev. 93.31 B. C. datum).

Extremes of stage.— Current year: Maximum stage recorded, 6.70 feet on April 19. Minimum stage recorded, 1.44 feet, September 14.

1907–1919: Maximum stage recorded, 8.20 feet on April 7, 1913. Minimum stage recorded, 0.25 foot on December 4, 1908.

Coöperation.— Gage heights furnished through the courtesy of Mr. D. A. Loomis, general manager of the Champlain Transportation Company to the United States Geological Survey.

Daily gage height, in feet, of LAKE CHAMPLAIN AT BURLINGTON, VERMONT, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	a	2.18	a	2.75	4.75	a	a	3.47	2.56	4.82	a	a
2.....	3.19	a	1.52	a	4.95	a	4.20	a	a	4.80	5.80	4.85
3.....	a	a	a	2.74	a	4.75	4.30	3.43	2.68	4.77	5.76	4.79
4.....	a	2.06	a	a	4.95	4.70	a	a	2.76	4.78	a	4.74
5.....	3.04	a	a	3.00	5.00	a	a	3.30	2.82	4.80	5.68	4.60
6.....	a	1.92	a	a	4.97	4.62	a	a	2.88	a	5.82	a
7.....	a	1.92	1.60	3.65	a	a	a	3.22	2.96	4.90	a	a
8.....	a	a	a	4.06	4.80	a	4.12	a	2.98	5.22	5.70	a
9.....	a	2.09	a	4.15	a	4.35	a	a	a	5.47	5.74	a
10.....	2.93	a	a	4.24	a	4.30	a	3.10	3.02	a	5.67	4.33
11.....	2.89	a	1.50	4.22	4.72	a	a	a	3.12	5.50	a	4.22
12.....	2.84	2.14	a	a	4.60	a	a	3.00	3.14	5.93	5.57	4.16
13.....	a	a	a	a	a	4.13	a	2.97	a	a	5.45	4.06
14.....	a	a	1.44	a	4.42	a	3.88	a	a	6.50	5.38	3.97
15.....	2.78	2.10	a	a	a	a	a	a	3.24	6.58	5.25	a
16.....	a	2.08	1.49	4.10	4.22	4.33	a	a	a	6.60	a	3.96
17.....	2.72	a	a	4.02	a	4.43	3.75	2.86	3.14	6.65	a	3.90
18.....	2.71	a	a	a	4.30	4.38	3.72	2.82	3.20	6.67	a	3.88
19.....	a	2.02	a	a	4.67	a	a	a	3.37	6.70	5.07	a
20.....	a	1.98	1.67	a	5.03	a	a	2.74	3.46	a	5.07	3.80
21.....	2.60	a	1.70	a	5.23	a	3.60	2.70	3.70	6.60	5.02	a
22.....	a	1.92	a	3.93	5.28	a	a	a	3.87	6.58	4.95	a
23.....	2.52	1.86	1.76	3.95	a	4.13	a	a	a	a	a	a
24.....	2.48	a	1.82	a	a	a	3.55	2.60	4.07	6.36	5.30	3.50
25.....	a	a	1.89	a	a	a	a	2.56	4.10	a	a	a
26.....	2.30	a	2.06	3.90	5.15	a	a	2.56	4.10	6.22	5.33	3.35
27.....	2.20	1.75	2.16	a	a	a	a	a	4.10	6.12	5.31	3.27
28.....	a	a	2.46	a	a	4.37	a	2.48	4.28	6.06	5.26	a
29.....	2.20	a	a	3.90	4.90	a	n	.....	4.60	6.02	5.19	a
30.....	a	1.54	2.76	4.10	a	4.33	3.50	.....	a	5.96	a	3.16
31.....	a	a	.....	4.40	.....	4.30	a	.....	4.78	.....	5.06	.....

a No record.

RICHELIEU RIVER AT FORT MONTGOMERY, ROUSES POINT

Location.—Inside the fort, $\frac{3}{8}$ mile south of the international boundary, about $\frac{1}{2}$ mile above head of Richelieu river, the outlet of Lake Champlain, and 1 mile northeast of the village of Rouses Point, Clinton county.

Drainage area.—7,870 square miles, including 436 miles of water-surface (from annual report of New York State Engineer and Surveyor).

Records available.—1875 to 1919.

Gage.—Staff, inside the fort. Elevation of gage zero, 92.50 feet above mean sea-level; read by Thomas Bourke.

Extremes of stage.—Current year: Maximum elevation recorded, 99.15 feet at 10 A. M. on April 20. Minimum elevation recorded, 93.65 feet at 10 A. M., September 10.

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 198

1869-1919: Maximum elevation recorded, 103.28 feet in April, 1869.* Minimum elevation recorded, 91.9 feet, November 13, 1908.

Coöperation.—Gage heights observed under direction of the corps of engineers of the United States Army and reported weekly to the United States Geological Survey.

* Hoyt, J. C., Stream Measurements, 1908, North Atlantic, St. Lawrence river and Great Lakes Drainage: U. S. Geological Survey Water-Supply paper 97, page 340, 1904.

Daily gage height, in feet, of RICHELIEU RIVER AT FORT MONTGOMERY, ROUSSEAU POINT, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.95	1.9	1.4	2.35	4.35	4.35	3.85	3.15	2.15	4.35	5.5	4.6
2.....	2.9	1.9	1.45	2.6	4.55	4.4	3.8	3.1	2.3	4.4	5.58	4.57
3.....	2.9	1.75	1.55	2.4	4.6	4.35	3.85	3.05	2.3	4.45	5.37	4.44
4.....	2.85	1.8	1.3	2.45	4.6	4.25	3.85	3.0	2.45	4.4	5.3	4.35
5.....	2.8	1.85	1.4	2.6	4.55	4.2	3.85	2.95	2.4	4.4	5.3	4.3
6.....	2.8	1.65	1.3	2.9	4.6	4.1	3.85	2.95	2.5	4.45	5.3	4.25
7.....	2.75	1.7	1.3	3.3	5.0	4.45	3.9	2.9	2.55	4.6	5.7	4.1
8.....	2.7	1.65	1.3	3.6	4.4	4.2	3.9	2.85	2.55	4.8	5.2	4.18
9.....	2.75	1.7	1.3	3.85	5.4	4.0	3.9	2.8	2.65	4.95	5.23	4.22
10.....	2.65	1.8	1.15	3.9	4.3	3.85	3.85	2.75	2.7	5.5	5.2	4.05
11.....	2.65	2.1	1.2	3.9	4.25	4.15	3.8	2.7	2.7	5.3	5.15	3.9
12.....	2.6	1.85	1.5	3.9	4.25	4.3	3.7	2.65	2.75	5.55	5.05	3.95
13.....	2.55	1.9	1.25	4.05	4.55	3.8	3.65	2.6	2.8	6.05	5.05	3.85
14.....	2.5	1.85	1.2	3.8	4.1	4.05	3.6	2.6	2.8	6.2	5.0	3.82
15.....	2.5	1.8	1.2	3.7	4.15	3.75	3.5	2.55	2.8	6.3	4.88	3.75
16.....	2.5	1.7	1.2	3.75	3.95	3.95	3.5	2.5	2.9	6.4	4.86	3.67
17.....	2.45	1.7	1.2	3.65	3.95	3.8	3.45	2.45	2.9	6.45	4.85	3.6
18.....	2.4	1.7	1.2	3.55	3.9	3.95	3.4	2.4	3.0	6.4	4.73	3.53
19.....	2.4	1.65	1.3	3.6	4.25	3.95	3.35	2.4	3.05	6.4	4.75	3.57
20.....	2.35	1.7	1.3	4.25	4.6	4.05	3.3	2.35	3.15	6.65	4.72	3.5
21.....	2.3	1.65	1.35	3.65	4.85	3.85	3.2	2.35	3.25	6.2	4.65	3.38
22.....	2.3	1.6	1.4	3.55	4.85	4.15	3.25	2.3	3.3	6.3	4.6	3.25
23.....	2.3	1.65	1.5	3.6	4.9	3.8	3.2	2.3	3.45	6.25	4.87	3.32
24.....	2.2	1.55	1.5	3.6	4.95	3.8	3.15	2.2	3.5	6.2	4.92	3.2
25.....	2.25	1.55	1.65	3.75	4.85	3.95	3.2	2.25	3.7	6.0	4.93	3.08
26.....	2.25	1.6	1.75	3.6	4.65	4.0	3.25	2.15	3.8	6.05	4.92	3.12
27.....	2.15	1.45	1.95	3.65	4.6	3.95	3.25	2.1	3.85	5.85	4.88	2.94
28.....	1.95	1.55	2.35	3.8	4.7	3.85	3.2	2.1	3.9	5.8	4.88	2.87
29.....	2.0	1.8	2.2	3.65	4.6	3.9	3.2	.....	3.95	5.55	4.81	2.83
30.....	2.0	1.35	2.3	3.7	4.6	3.9	3.15	.....	4.2	5.5	4.67	2.82
31.....	1.85	1.45	.....	4.1	.....	3.85	3.15	.....	4.3	.....	4.65	.....

WOOD CREEK

DESCRIPTION

Wood creek proper rises among the hills in the central part of Washington county, at an elevation of about 300 feet, and flows in a general northerly direction, entering Lake Champlain at Whitehall. It has a number of tributaries, the two larger on the east being Big creek, also called East creek, which enters at Smith's Basin, and Mettawee river, which enters about $1\frac{1}{2}$ miles above Whitehall. Big creek rises in the central part of Washington county at an elevation of about 1,000 feet, descending rapidly for a short distance to South Hartford, then falling slowly to Smith's Basin. Mettawee river is an interstate stream, rising in Dorset mountains, Vermont, crossing the State line into New York at Granville and entering Wood creek about $1\frac{1}{2}$ miles above Whitehall. The drainage basin is a rugged area of rock mostly forest covered and tributaries are rather numerous and branching, there being no lakes or marshes. The principal tributary on the west is Halfway creek, entering Wood creek near Fort Ann. This creek with its tributaries is the outlet of Glen lake and several smaller lakes and ponds in the hilly region to the north of Glens Falls.

Wood creek flows through a by-pass at lock No. 9, passing over a concrete spillway that has a crest length of 50 feet at elevation 131.0 and enters the lower pool of the Barge canal just below lock No. 9. From this point to Lake Champlain it has been canalized as a part of the Barge canal system.

WOOD CREEK ABOVE DAM AT SMITH'S BASIN

Gage No. 122

This station, established October 24, 1916, gives pool elevations spillway at lock No. 9. The gage, No. 122, is a standard Type A gage, having a range of 6 feet, between elevations 132.0 and 138.0, secured to the west wing of the spillway. A standard bench-mark plug is set near the gage at elevation 137.0 (B. C. datum).

It is read twice daily — 6 A. M. and 4 or 6 P. M. — to hundredths.

Daily elevation of water-surface (B. C. datum) of WOOD CREEK ABOVE DAM AT SMITH'S BASIN, for the year ended June 30, 1919. G. H. Barrett, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	132.60	132.50	132.65	132.85	133.08	132.74	132.88	132.78	133.85	132.90	132.69	132.65
2	132.60	132.50	132.65	132.80	132.92	132.70	133.16	132.80	133.48	132.89	132.82	132.65
3	132.60	132.51	132.65	132.76	132.80	132.69	132.92	132.75	133.10	132.92	132.85	132.72
4	132.60	132.60	132.65	132.75	132.79	132.69	132.82	132.72	133.00	132.98	132.72	132.70
5	132.59	132.50	132.60	132.71	132.85	132.70	132.90	132.69	133.00	133.08	132.78	132.62
6	132.60	132.50	132.59	132.82	132.80	132.68	132.95	132.65	132.92	132.98	132.78	132.62
7	132.66	132.50	132.60	132.86	132.76	132.65	132.90	132.65	132.88	132.94	132.74	132.65
8	132.64	132.50	132.60	132.88	132.76	132.65	132.85	132.64	132.80	132.86	132.85	132.65
9	132.65	132.54	132.60	132.79	132.75	132.65	132.79	132.65	133.40	132.86	132.80	132.70
10	132.64	132.59	132.60	132.76	132.75	132.70	132.78	132.64	133.74	132.84	132.78	132.75
11	132.64	132.58	132.59	132.70	132.74	132.70	132.78	132.62	133.14	132.88	132.80	132.80
12	132.64	132.56	132.58	132.69	132.72	132.69	132.85	132.60	132.97	133.48	132.75	132.70
13	132.61	132.54	132.58	132.70	132.70	132.66	132.76	132.60	132.88	133.25	132.75	132.68
14	132.62	132.57	132.62	132.70	132.70	132.66	132.74	132.62	132.84	132.95	132.72	132.65
15	132.65	132.55	132.64	132.70	132.70	133.05	132.70	132.72	132.78	132.84	132.68	132.65
16	132.66	132.56	132.61	132.69	132.69	133.10	132.66	132.80	132.85	132.82	132.68	132.68
17	132.66	132.55	132.64	132.68	132.68	132.95	132.66	132.80	133.15	133.28	132.80	132.70
18	132.66	132.55	132.64	132.66	132.85	132.82	132.65	132.75	133.09	133.02	133.05	132.65
19	132.64	132.54	132.71	132.66	134.18	132.75	132.70	132.70	133.14	132.90	132.68	132.62
20	132.64	132.55	132.72	132.65	133.45	132.72	132.70	132.69	132.98	132.80	132.80	132.60
21	132.62	132.55	132.92	132.66	133.10	132.68	132.66	132.65	133.15	132.78	132.78	132.60
22	132.60	132.52	132.98	132.66	132.98	132.69	132.68	132.65	133.12	132.68	133.28	132.60
23	132.59	132.50	132.97	132.68	132.89	133.38	132.77	132.62	132.82	132.68	133.32	132.60
24	132.60	132.49	132.80	132.66	132.84	133.16	133.62	132.65	132.80	132.70	132.95	132.60
25	132.58	132.53	132.80	132.66	132.79	133.35	133.02	132.65	132.79	132.72	132.95	132.60
26	132.56	132.48	133.20	132.66	132.75	133.30	133.05	132.70	132.78	132.70	132.98	132.60
27	132.56	132.46	133.85	132.72	132.73	133.00	132.88	132.85	132.79	132.70	132.92	132.65
28	132.55	132.45	133.30	132.74	132.72	132.88	132.85	132.90	133.78	132.68	132.78	132.62
29	132.54	132.40	133.04	132.71	132.75	132.85	132.86	.....	133.00	132.70	132.78	132.60
30	132.50	132.40	132.92	132.72	132.74	132.85	132.82	.....	133.05	132.69	132.72	132.60
31	132.62	132.40	.....	133.22	.....	a	132.80	.....	132.88	.....	132.70	.....

a No record.

BARGE CANAL ABOVE LOCK No. 9, AT SMITH'S BASIN

Gage No. 120

This station, established October 24, 1916, gives pool elevations on the summit level between locks Nos. 8 and 9. The gage, No. 120, is a standard Type A gage, having a range of 4 feet, between elevations 137.0 and 141.0, secured to the east lock wall at the upper end of the upper gate recess. A standard benchmark plug is set near the gage at elevation 142.0 (B. C. datum).

The gage is read twice daily—6 A. M. and 4 or 6 P. M.—to hundredths. During the winter the water drops below the gage, the supply from the Glens Falls feeder being shut off.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL ABOVE LOCK No. 9, AT SMITH'S BASIN, for the year ended June 30, 1919. G. H. Barrett, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	139.42	139.42	139.72	138.92	139.28	139.12					138.60	138.92
2	139.06	139.50	139.59	139.28	139.20	138.95					138.45	139.27
3	139.10	139.45	139.78	139.22	139.12	138.92					138.38	139.10
4	139.82	139.55	139.92	139.18	139.12	139.12					139.35	139.00
5	139.85	139.55	139.78	139.18	139.15	139.10					139.25	139.00
6	139.78	139.48	139.30	139.25	139.22	139.25					139.30	139.25
7	139.65	139.50	139.28	139.52	139.14	138.95					139.25	139.35
8	139.45	139.52	139.42	139.20	139.08	139.10					139.35	138.92
9	139.58	139.80	139.85	139.38	139.05	138.68					139.00	139.20
10	139.38	139.78	139.62	139.32	138.98	138.55					139.00	139.20
11	139.28	139.95	139.75	139.30	139.05	138.22					139.15	139.25
12	139.62	139.54	139.96	139.40	139.20	137.10					139.30	139.25
13	139.38	139.40	139.54	139.22	139.22	135.41					139.05	139.15
14	139.72	139.25	139.80	139.32	138.90	130.20					139.00	139.15
15	139.65	139.40	140.02	139.30	138.65	129.08					138.95	138.95
16	139.78	139.35	139.55	139.20	138.65	129.35					138.85	139.10
17	139.68	139.18	139.75	139.30	138.70	129.05					139.00	139.40
18	139.40	139.08	139.85	139.20	139.22	128.85					139.30	139.10
19	139.48	139.05	139.70	139.15	138.92	128.69					138.75	139.00
20	139.58	138.92	140.00	139.10	138.78	128.50					139.30	139.05
21	139.70	138.65	139.43	138.90	138.98	128.50					139.15	138.95
22	139.75	138.62	139.80	138.90	139.25	128.45				137.95	138.85	138.99
23	139.50	138.25	139.85	138.80	138.80	129.00				138.78	139.10	139.25
24	139.58	138.70	139.55	138.52	138.82					139.20	139.15	139.28
25	139.66	138.72	139.25	138.75	139.05					139.40	139.10	139.40
26	139.80	138.72	139.48	139.02	139.25					138.87	139.25	139.35
27	139.42	138.55	139.00	139.10	139.30					138.90	139.15	139.00
28	139.55	138.80	139.28	139.29	139.02					138.85	139.20	138.88
29	139.50	138.75	139.15	139.16	138.72					138.85	139.15	138.72
30	139.25	139.15	139.52	139.26	138.90					138.85	139.30	138.75
31	139.18	139.38		139.12							139.40	

NOTE.—Water below gage from December 23 to April 21, inclusive; no record.

WOOD CREEK BELOW LOCK No. 9, AT SMITH'S BASIN

Gage No. 121

This station, established October 24, 1916, gives the elevation of the lower pool at lock No. 9. The gage, No. 121, a standard Type A gage, having a range of 4 feet, between elevations 123.0 and 127.0, secured to the east lock wall at the upper end of the lower gate recess, was superseded on November 20, 1917, by a standard Type A gage, secured to the north end of the lower east approach wall. The gage has a range of 8 feet, between elevations 123.0 and 131.0. A standard bench-mark plug is set in the wall near the gage at elevation 130.0 (B. C. datum).

The gage is read twice daily—6 A. M. and 4 or 6 P. M.—to hundredths.

Daily elevation of water-surface (B. C. datum) of WOOD CREEK BELOW LOCK No. 9, AT SMITH'S BASIN, for the year ended June 30, 1919. G. H. Barrett, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	124.36	124.32	124.48	124.55	124.92	124.55	124.38	124.42	126.80	124.75	124.58	124.47
2	124.42	124.28	124.45	124.48	124.70	124.38	125.32	124.32	125.78	124.66	124.80	124.40
3	124.65	124.25	124.48	124.50	124.58	124.50	124.95	124.28	125.20	124.65	124.88	124.58
4	124.40	124.32	124.38	124.48	124.61	124.48	124.55	124.26	124.85	125.00	124.68	124.55
5	124.38	124.30	124.32	124.40	124.65	124.50	124.50	124.22	124.92	125.10	124.65	124.38
6	124.35	124.32	124.38	124.61	124.60	124.50	124.45	124.20	124.78	124.90	124.68	124.45
7	124.45	124.35	124.38	124.35	124.50	124.48	124.45	124.20	124.70	124.85	124.80	124.55
8	124.42	124.28	124.38	123.78	124.50	124.42	124.50	124.20	124.65	124.84	124.88	124.62
9	124.40	124.35	124.40	124.10	124.45	124.45	124.48	124.20	125.62	124.81	124.62	124.65
10	124.36	124.38	124.28	123.28	124.45	124.42	124.48	124.18	126.32	124.72	124.75	125.02
11	124.58	124.35	124.30	124.25	124.48	124.38	124.50	124.15	125.22	124.62	124.80	124.78
12	124.50	124.32	124.32	124.38	124.48	124.36	124.48	124.15	124.88	126.10	124.85	124.65
13	124.45	124.38	124.30	124.45	124.45	124.40	124.45	124.15	124.78	125.25	124.72	124.48
14	124.42	124.30	124.32	124.42	124.41	124.39	124.42	124.22	124.60	124.90	124.62	124.50
15	124.42	124.32	124.30	124.40	124.40	125.10	124.38	124.45	124.42	124.82	124.60	124.62
16	124.42	124.32	124.38	124.36	124.39	124.98	124.38	124.60	124.42	124.75	124.58	124.78
17	124.46	124.42	124.42	124.38	124.35	124.60	124.86	124.58	124.78	125.35	124.68	124.75
18	124.48	124.23	124.45	124.40	124.90	124.50	124.36	124.30	125.06	125.00	125.05	124.65
19	124.38	124.25	124.50	124.38	127.02	124.45	124.38	124.30	124.95	124.85	124.75	124.68
20	124.40	124.32	124.50	124.20	125.52	124.48	124.40	124.28	124.80	124.68	124.65	124.50
21	124.34	124.35	124.70	124.35	125.00	124.45	124.36	124.28	125.02	124.72	124.72	124.45
22	124.36	124.32	124.70	124.35	124.80	124.50	124.35	124.25	124.98	124.75	125.45	124.52
23	124.30	124.30	124.55	124.38	124.72	125.52	124.44	124.28	124.85	124.62	125.50	124.50
24	124.28	124.35	124.48	124.35	124.58	124.98	126.32	124.32	124.70	124.64	125.00	124.52
25	124.25	124.25	124.52	124.29	124.55	125.45	124.95	124.35	124.62	124.62	124.95	124.45
26	124.28	124.30	125.35	124.30	124.58	125.35	124.72	124.38	124.58	124.50	125.08	124.42
27	124.30	124.30	126.12	124.45	124.50	124.78	124.55	124.40	121.62	124.52	124.82	124.62
28	124.28	124.32	125.10	124.48	124.48	124.65	124.52	124.42	120.12	124.58	124.85	124.48
29	124.32	124.28	124.70	124.40	124.60	124.48	124.50	.....	125.05	124.60	124.75	124.45
30	124.25	124.35	124.65	124.42	124.62	124.40	124.46	.....	124.98	124.60	124.68	124.45
31	124.28	124.28	.....	125.70	.....	a	124.45	.....	124.85	.....	124.60	.....

a No record.

WOOD CREEK ABOVE LOCK No. 11, NEAR COMSTOCK

Gage No. 123

This station, established October 29, 1916, is located at lock No. 11, about $\frac{3}{4}$ mile north of Comstock. The gage, No. 123, is a standard Type A gage, having a range of 4 feet, between elevations 122.0 and 126.0, secured to the upper end of the upper gate recess of the east lock wall. A standard bench-mark plug is located near the gage at elevation 129.0 (B. C. datum).

The gage is read twice daily — at 6 A. M. and 6 P. M. or 8 A. M. and 4 P. M.—to hundredths.

Daily elevation of water-surface (B. C. datum) of WOOD CREEK ABOVE LOCK 11, NEAR COMSTOCK, for the year ended June 30, 1919. Chas. A. Hines, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	124.33	124.32	124.34	124.42	124.88	124.48	124.38	124.22	126.15	124.64	124.45	124.42
2.....	124.38	124.26	124.40	124.38	124.60	124.42	125.08	124.16	125.12	124.63	124.85	124.39
3.....	124.31	124.25	124.35	124.38	124.40	124.51	124.66	124.27	124.91	124.65	124.72	124.45
4.....	124.25	124.23	124.30	124.38	124.50	124.42	124.60	124.22	124.78	124.89	124.51	124.48
5.....	124.36	124.26	124.28	124.35	124.56	124.46	124.48	124.22	124.84	125.02	124.56	124.42
6.....	124.24	124.24	124.28	124.60	124.50	124.38	124.54	124.18	124.62	124.89	124.58	124.36
7.....	124.35	124.30	124.25	124.25	124.46	124.32	124.60	124.20	124.50	124.82	124.54	124.39
8.....	124.38	124.28	124.28	123.80	124.42	124.38	124.60	124.15	124.40	124.76	124.71	124.54
9.....	124.30	124.27	124.26	124.05	124.42	124.42	124.58	124.13	124.65	124.78	124.59	124.64
10.....	124.37	124.26	124.25	123.35	124.39	124.42	124.42	124.10	125.09	124.68	124.52	125.00
11.....	124.48	124.28	124.30	124.15	124.40	124.30	124.45	124.00	124.98	124.74	124.53	124.62
12.....	124.42	124.32	124.25	124.36	124.40	124.32	124.41	124.20	124.72	125.95	124.56	124.45
13.....	124.35	124.29	124.25	124.30	124.33	124.36	124.47	124.12	124.65	125.22	124.55	124.39
14.....	124.40	124.27	124.28	124.30	124.39	124.36	124.40	124.06	124.49	124.88	124.49	124.38
15.....	124.35	124.31	124.25	124.29	124.28	124.90	124.38	124.39	124.42	124.75	124.52	124.52
16.....	124.32	124.33	124.31	124.25	124.36	124.89	124.39	124.48	124.48	124.72	124.46	124.70
17.....	124.35	124.28	124.28	124.31	124.28	124.58	124.32	124.47	124.95	125.24	124.50	124.50
18.....	124.42	124.30	124.36	124.25	124.72	124.48	124.22	124.36	125.12	124.90	125.02	124.42
19.....	124.40	124.26	124.41	124.24	126.65	124.38	124.30	124.25	124.92	124.78	124.70	124.42
20.....	124.32	124.29	124.45	124.28	125.31	124.29	124.31	124.22	124.74	124.73	124.62	124.38
21.....	124.28	124.22	124.62	124.35	124.95	124.32	124.28	124.20	124.76	124.62	124.52	124.36
22.....	124.26	124.20	124.48	124.38	124.78	124.36	124.28	124.28	124.75	124.67	125.64	124.28
23.....	124.28	124.28	124.43	124.35	124.65	125.30	124.34	124.20	124.56	124.60	125.36	124.35
24.....	124.26	124.22	124.30	124.20	124.55	124.88	125.85	124.24	124.52	124.50	124.86	124.30
25.....	124.12	124.20	124.48	124.25	124.52	125.30	124.86	124.32	124.52	124.52	124.80	124.38
26.....	124.30	124.34	125.26	124.35	124.50	125.20	124.64	124.30	124.52	124.46	125.04	124.36
27.....	124.25	124.32	126.45	124.40	124.40	124.79	124.51	124.13	124.52	124.46	124.74	124.40
28.....	124.28	124.25	125.00	124.40	124.41	124.60	124.46	124.28	125.83	123.46	124.61	124.44
29.....	124.28	124.22	124.65	124.34	124.60	124.50	124.42	.....	124.52	124.52	124.52	121.28
30.....	124.25	124.22	124.56	121.42	124.58	124.46	124.40	.....	124.87	124.58	124.52	124.35
31.....	124.28	124.20	.....	125.51	.....	124.42	124.38	.....	124.78	.....	121.44	.....

WOOD CREEK BELOW LOCK No. 11, NEAR COMSTOCK

Gage No. 124

This station, established October 29, 1916, is located at lock No. 11, about $\frac{3}{4}$ mile north of Comstock. The gage, No. 124, a standard Type A gage, having a range of 4 feet, between elevations 110.0 and 114.0, secured to the upper end of the lower gate recess of the east lock wall, was superseded on December 21, 1917, by a standard Type A gage, secured to the east side of the lower east approach wall. The gage has a range of 8 feet, between elevations 110.0 and 118.0. A standard bench-mark plug is set in the wall near the gage at elevation 116.0 (B. C. datum).

The gage is read twice daily — at 6 A. M. and 6 P. M. or 8 A. M. and 4 P. M.— to hundredths.

Daily elevation of water-surface (B. C. datum) of WOOD CREEK BELOW LOCK 11, NEAR COMSTOCK, for the year ended June 30, 1919. Chas. A. Hines, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	112.22	111.75	112.44	112.45	112.10	112.25	112.39	112.25	114.68	112.60	112.28	112.32
2.....	112.42	111.90	112.40	112.35	112.25	111.78	112.50	112.42	112.25	112.49	112.28	112.09
3.....	112.47	111.81	112.20	112.00	112.35	112.35	112.22	112.08	112.40	112.29	112.28	112.22
4.....	112.48	112.12	112.08	112.35	112.42	112.38	112.54	112.14	111.98	112.45	112.36	112.30
5.....	112.40	112.22	112.05	112.52	112.38	112.40	112.38	112.15	112.25	110.82	112.34	112.28
6.....	112.56	112.02	112.08	112.32	112.00	112.21	112.26	111.94	112.20	112.28	112.48	112.25
7.....	112.47	111.98	111.88	112.15	112.44	111.38	112.00	111.98	112.16	112.22	112.32	112.35
8.....	112.15	111.81	112.15	112.45	112.45	112.35	112.06	111.98	112.35	112.35	112.41	112.59
9.....	111.96	111.82	112.20	112.30	112.32	111.82	112.38	112.33	112.62	112.18	112.38	112.50
10.....	111.95	111.98	112.06	112.10	112.22	112.35	112.02	111.78	112.94	112.38	112.38	112.41
11.....	112.40	112.26	111.78	111.75	112.40	112.10	112.12	110.68	112.25	112.24	112.38	112.45
12.....	112.16	112.26	111.58	112.08	112.26	111.75	111.92	109.38	112.12	113.12	112.40	112.28
13.....	112.36	112.28	111.68	112.15	112.20	112.09	111.94	109.18	112.48	112.16	112.32	112.27
14.....	112.48	112.32	111.88	112.02	112.22	112.30	111.88	109.20	112.20	112.32	112.33	112.32
15.....	112.28	112.28	112.40	111.99	112.04	112.44	111.94	110.80	112.35	112.08	112.42	112.30
16.....	112.45	111.96	112.32	112.15	112.24	112.34	112.02	112.10	112.02	112.25	112.22	112.30
17.....	112.48	111.75	112.15	111.75	112.20	112.30	112.18	111.95	111.98	112.12	112.34	112.30
18.....	112.38	112.10	111.94	111.80	112.48	112.28	112.05	111.93	112.32	112.26	112.42	112.32
19.....	112.22	112.09	112.45	112.05	113.50	112.30	112.29	111.52	112.18	112.35	112.28	112.18
20.....	112.55	111.68	112.40	112.28	112.38	112.27	111.92	110.94	112.15	112.21	112.40	112.25
21.....	112.51	111.48	112.32	112.05	111.85	112.42	111.78	110.28	112.25	112.28	112.48	112.38
22.....	112.22	111.45	112.45	111.98	112.20	112.48	111.68	110.95	112.55	112.28	112.78	112.35
23.....	112.15	111.78	112.39	111.92	112.40	112.52	111.78	112.30	112.35	112.29	112.62	112.17
24.....	111.81	111.90	112.35	112.15	112.19	112.48	114.14	112.07	112.28	112.11	112.28	112.22
25.....	111.72	112.09	112.37	112.30	111.80	112.46	112.47	112.27	112.30	112.08	112.42	112.26
26.....	111.80	112.20	112.76	112.20	112.38	112.42	112.47	112.28	112.22	112.10	112.48	112.28
27.....	111.98	112.02	112.54	112.30	112.40	112.28	112.05	112.31	112.28	112.16	112.38	112.25
28.....	112.45	111.92	112.08	112.20	112.42	112.32	112.35	112.22	113.04	112.08	112.38	112.40
29.....	112.42	112.02	111.95	112.10	112.30	112.20	112.28	.....	112.24	112.26	112.21	111.90
30.....	112.22	111.90	112.35	112.35	112.32	112.42	112.36	.....	112.28	112.28	112.42	112.15
31.....	112.00	111.88	.....	112.75	.....	112.14	112.02	.....	112.48	.....	112.38	.....

WOOD CREEK ABOVE LOCK No. 12, AT WHITEHALL

Gage No. 125

This station, established October 1, 1916, is located at the upper end of lock No. 12. The gage, No. 125, is a standard Type A gage, secured to the upper end of the east upper gate recess and has a range of 4 feet, between elevations 110.0 and 114.0. A standard bench-mark plug is set in the wall above the gage at elevation 118.0 (B. C. datum).

The gage is read twice daily—at 6 A. M. and 5 or 6 P. M.—to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (B. C. datum) of WOOD CREEK ABOVE LOCK No. 12, AT WHITEHALL, for the year ended June 30, 1919. W. J. Berry and H. Pfandler, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	112.00	111.35	112.25	112.22	111.75	111.90	112.15	112.05	113.50	112.10	112.18	112.20
2	112.25	111.55	112.28	112.20	112.00	111.60	112.10	112.20	111.90	112.10	112.10	111.98
3	112.20	111.62	111.98	111.80	111.98	112.10	112.00	112.00	112.08	112.00	112.00	112.00
4	112.18	112.00	111.98	112.30	112.15	112.15	112.20	111.90	111.88	112.20	112.08	112.12
5	112.15	112.05	111.90	112.35	112.05	112.05	112.10	112.00	112.18	111.08	112.10	112.10
6	112.30	111.85	111.82	112.15	111.82	111.70	112.15	111.88	112.05	111.88	112.15	112.15
7	112.20	111.80	111.68	111.90	112.20	111.60	112.00	111.85	111.95	112.10	112.18	112.25
8	112.15	111.75	112.02	112.20	112.10	112.20	112.30	111.75	112.22	112.08	112.25	112.40
9	111.82	111.60	112.00	112.12	112.15	112.10	112.30	112.20	112.30	112.00	112.12	112.32
10	111.75	111.85	111.80	111.85	112.05	112.05	112.10	111.70	111.80	112.20	112.20	112.25
11	112.22	112.15	111.58	111.50	112.15	111.65	112.10	110.90	111.35	112.10	112.10	112.20
12	112.00	112.05	111.42	111.98	111.90	111.70	112.10	109.62	111.95	112.00	112.15	112.12
13	112.30	112.22	111.45	112.08	111.95	111.75	112.00	108.85	112.05	112.15	112.15	112.15
14	112.32	112.12	111.68	111.78	112.05	111.95	112.10	108.80	111.90	111.85	112.15	112.12
15	112.12	111.88	112.02	111.80	111.85	111.95	112.10	109.90	112.15	112.00	112.15	112.10
16	112.25	111.65	112.10	111.92	112.10	112.00	112.00	111.85	111.85	112.05	112.15	112.10
17	112.20	111.45	111.95	111.55	112.05	112.15	112.20	111.80	111.80	111.85	112.20	112.12
18	112.18	111.90	111.78	111.45	112.25	112.00	112.00	111.60	112.00	112.00	112.12	112.15
19	112.15	111.85	112.25	111.78	111.65	112.05	112.20	111.30	111.80	112.05	112.12	112.15
20	112.32	111.50	112.25	112.20	111.48	112.00	112.20	110.30	111.95	112.05	112.20	112.05
21	112.30	111.30	112.20	111.85	111.55	112.05	111.48	109.85	112.00	112.22	112.25	112.18
22	112.02	111.42	112.18	111.85	112.00	112.10	111.35	110.65	112.15	112.05	111.35	112.10
23	111.78	111.62	112.20	111.80	112.15	111.90	111.45	112.05	111.95	112.12	111.55	111.95
24	111.68	111.70	112.18	111.92	112.05	112.22	111.65	111.70	112.00	111.98	112.12	112.02
25	111.45	111.95	112.28	112.10	111.65	111.95	111.90	112.10	112.08	111.88	112.15	112.10
26	111.50	112.08	112.05	112.15	112.15	112.00	112.02	112.00	112.05	111.82	112.20	112.15
27	111.80	111.90	111.32	112.05	112.05	112.00	111.95	112.00	112.08	111.85	112.30	112.12
28	112.22	111.70	111.80	112.00	112.18	112.10	111.95	111.80	112.10	111.90	112.18	112.15
29	112.28	111.82	111.80	112.00	112.05	112.00	112.10	.....	112.00	111.80	119.08	111.88
30	112.02	111.75	112.15	112.15	112.12	112.00	112.05	.....	112.00	111.90	112.20	112.00
31	111.62	111.62	.....	111.72	.....	112.10	111.82	.....	112.05	.....	112.20	.....

LAKE GEORGE

For the purpose of determining the rate of change and the range in elevation of the water-surface of the lake, gages were established on Lake George in July, 1913, at three points — Lake George, Sagamore (Bolton Landing) and Rogers Rock — by the United States Geological Survey in coöperation with the New York State Conservation Commission.

The gages were not set to any particular datum, but each was referred to a substantial bench-mark by the use of an engineer's level. The gages were read once each day to the nearest half-tenth and the force and direction of the wind recorded.

A comparative study of these gage heights and those obtained at the mill of the International Paper Company indicates that the zeros of all three gages are below the crest of the dam as follows:

Lake George	4.75 feet below crest
Sagamore	4.9 feet below crest
Rogers Rock	3.4 feet below crest

All three gages were read until June 30, 1914. Comparison of the records up to this date showed that one gage would indicate the mean elevation of the lake and the observations at Lake George and Sagamore were discontinued July 1, 1914.

LAKE GEORGE AT ROGERS ROCK

Location.— At a boat-house in a small bay on the north side of the steamboat landing at Rogers Rock, Essex county.

Drainage area.— Not measured.

Records available.— July 10, 1913, to June 30, 1919.

Gage.— Vertical staff fastened to a pile in the back end of the boat-house. Datum, 3.15 * feet below crest of dam at outlet of lake. Gage read once daily by George O. Cook.

Extremes of stage.— Current year: Maximum stage recorded, 4.68 feet, May 24. Minimum stage recorded, 2.2 feet, October 27 and 29.

* Determined by levels; supersedes the estimated datum previously published.

1913-1919: Maximum stage recorded, 4.98 feet, May 2, 1914.
Minimum stage recorded, 1.2 feet on November 21 and December 22, 1916.

Regulation.—The elevation of lake surface is regulated by the operation of gates and wheels at the dam at the outlet of the lake at Ticonderoga.

Coöperation.—Station established by the United States Geological Survey in coöperation with the State Conservation Commission. Gage heights for current year furnished by International Paper Company.

Daily gage height, in feet, of LAKE GEORGE AT ROGERS ROCK, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.65	3.18	2.58	2.42	2.50	2.90	3.00	3.00	2.82	3.80	4.42	4.45
2.....	3.5	3.1	2.62	2.4	2.45	2.85	3.1	3.02	2.88	3.78	4.5	4.4
3.....	3.52	3.0	2.6	2.38	2.48	2.82	3.22	3.0	2.88	3.82	4.42	4.48
4.....	3.48	3.1	2.52	2.4	2.45	2.8	3.18	2.98	2.85	3.8	4.48	4.35
5.....	3.5	3.05	2.5	2.4	2.42	2.82	3.12	2.95	2.82	3.88	4.45	4.32
6.....	3.5	2.96	2.55	2.35	2.48	2.8	3.1	2.9	2.85	3.92	4.42	4.35
7.....	3.55	3.0	2.5	2.3	2.5	2.8	3.18	2.9	2.88	3.98	4.45	4.3
8.....	3.55	2.95	2.55	2.42	2.4	2.82	3.15	2.88	2.85	4.0	4.4	4.32
9.....	3.52	2.9	2.4	2.42	2.48	2.8	3.12	2.85	2.92	4.02	4.35	4.35
10.....	3.5	2.92	2.38	2.4	2.5	2.78	3.15	2.85	3.12	4.1	4.35	4.3
11.....	3.5	3.0	2.4	2.38	2.45	2.75	3.15	2.82	3.15	4.2	4.32	4.25
12.....	3.48	2.95	2.45	2.4	2.48	2.72	3.0	2.85	3.12	4.4	4.35	4.2
13.....	3.45	2.98	2.48	2.38	2.42	2.7	3.05	2.82	3.0	4.45	4.4	4.18
14.....	3.42	2.98	2.45	2.35	2.38	2.7	3.02	2.8	3.05	4.6	4.4	4.15
15.....	3.45	2.95	2.42	2.3	2.4	2.78	3.05	2.82	3.12	4.48	4.38	4.15
16.....	3.45	2.88	2.4	2.28	2.38	2.75	3.08	2.85	3.2	4.5	4.4	4.18
17.....	3.4	2.85	2.38	2.25	2.4	2.7	3.05	2.82	3.15	4.58	4.45	4.1
18.....	3.38	2.8	2.35	2.22	2.42	2.72	3.02	2.8	3.25	4.55	4.48	4.12
19.....	3.4	2.75	2.4	2.25	2.7	2.78	2.98	2.8	3.2	4.55	4.5	4.1
20.....	3.4	2.8	2.35	2.32	2.75	2.8	3.05	2.78	3.28	4.6	4.45	4.08
21.....	3.38	2.7	2.35	2.3	2.8	2.8	3.0	2.75	3.35	4.5	4.4	4.1
22.....	3.4	2.75	2.4	2.25	2.85	2.82	3.02	2.78	3.3	4.58	4.55	3.85
23.....	3.35	2.75	2.35	2.28	2.88	2.85	3.05	2.8	3.35	4.58	4.65	3.95
24.....	3.32	2.72	2.32	2.22	2.9	2.78	3.1	2.82	3.38	4.62	4.68	3.85
25.....	3.28	2.7	2.4	2.25	2.82	2.98	3.08	2.85	3.4	4.58	4.65	3.88
26.....	3.3	2.6	2.35	2.28	2.8	2.95	3.05	2.8	3.42	4.6	4.65	3.85
27.....	3.3	2.65	2.5	2.2	2.82	3.0	3.08	2.8	3.45	4.58	4.62	3.8
28.....	3.2	2.62	2.5	2.22	2.8	2.8	3.05	2.78	3.7	4.55	4.55	3.78
29.....	3.25	2.6	2.48	2.2	2.85	2.85	3.05	.....	3.78	4.52	4.6	3.82
30.....	3.3	2.58	2.45	2.22	2.9	2.9	3.08	.....	3.6	4.45	4.5	3.85
31.....	3.12	2.55	.....	2.42	.....	3.02	3.05	.....	3.85	.....	4.48	.....

AUSABLE RIVER

DESCRIPTION

Ausable river is formed by the junction of the east and west branches, which have their headwaters in the northwestern part of Essex county. The east branch flows from upper Ausable lake, at an elevation of 1,990 feet above sea-level. The west branch, formed by several small streams that lie in the valley to the west and north of the east branch, receives the outflow from Lake Placid at elevation 1,864 feet. Both branches flow north and east to their junction at the village of Ausable Forks, about 20 miles from the mouth of the stream along the river, from which point the river flows northeast, entering Lake Champlain about 10 miles south of Plattsburg and opposite and slightly north of the city of Burlington, Vt. In this 20 miles a total descent of 460 feet occurs, a portion of which is in the famous Ausable chasm.

The drainage basin of Ausable river occupies a plateau at a general elevation of 800 to 1,200 feet, the mountainous boundaries of the watershed rising to altitudes of 3,000 to 5,000 feet. Throughout the entire course, the river is fed by small mountain streams that enter at nearly right angles from the mountains on either side. There are few lakes in this drainage area to act as regulators of the flow, and, owing to the great differences of elevation throughout the area, the stream has what is called a flashy discharge, its fluctuations being large and rapid.

Owing to the fact that this basin lies on the eastern slope of the Adirondack mountains, the average rainfall is less than for those basins whose streams rise on the western and southern slopes, the mean yearly precipitation being about 32 inches.

Drainage areas of AUSABLE RIVER*

LOCATION	AREA	
	Place to place	Total
	<i>Square miles</i>	<i>Square miles</i>
Lake Placid, water-surface.....		3.80
Lake Placid, drainage area.....	21.80	21.80
West branch from foot of Lake Placid to junction with east branch..	211.20	233.00
East branch above forks.....	196.90	429.90
Above gaging station.....	40.10	470.00
Gaging station to Keeseville.....	6.10	476.10
Keeseville to Birmingham.....	27.40	503.50
Birmingham to mouth.....	17.80	521.30

* From Willaboro, Ausable, Lake Placid, Mount Marcy and Elisabethtown sheets of the United States Geological Survey topographic maps.

AUSABLE RIVER AT AUSABLE FORKS

Location.—In the village of Ausable Forks, Clinton county, immediately below the junction of the east and west branches and about 15 miles above the mouth of the river.

Drainage area.—444 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—August 17, 1910, to June 30, 1919.

Gage.—Chain on left bank about 1,000 feet below junction of east and west branches; read by A. S. Baker.

Discharge measurements.—Made from a cable about $11\frac{1}{2}$ miles below gage, or by wading either near the cable or a short distance above the gage.

Channel and control.—Stone and gravel, occasionally shifting. Channel divided by an island opposite the gage.

Extremes of discharge.—Current year: Maximum stage recorded, 9.0 feet at 8 A. M., October 6; discharge, 15,600 second-feet. Minimum stage recorded, 3.36 feet at 5 P. M., July 27; discharge, 94 second-feet.

1910–1919: Maximum stage recorded, 10.2 feet in the evening of March 27, 1913; discharge, about 25,000 second-feet. Minimum stage recorded, 3.0 feet at 7 A. M., July 21, 1912; discharge, practically zero.

Special study.—A portable water-stage recorder was installed at this station and a continuous gage height record obtained, July 11 to September 30, 1914, which showed a continual small fluctuation in stage. It was shown that monthly mean discharge based on semidaily gage heights is in error as follows: July 11 to 31, 3.5 per cent; August, 4.1 per cent; September, 0.5 per cent. Some of the daily discharges showed greater errors, but these were largely compensating.

Ice.—Stage-discharge relation slightly affected by ice.

Accuracy.—Stage-discharge relation probably permanent between dates of shifting. Affected by ice for short periods from December to March. Rating curve fairly well defined between 175 and 3,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good.

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 205

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurement of AUSABLE RIVER AT AUSABLE FORKS, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		Feet	Sec.-ft.
Jan. 10 a.....	M. H. Carson.....	4.10	327

a Backwater present, due to ice.

Daily gage height, in feet, AUSABLE RIVER AT AUSABLE FORKS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.75	3.63	4.48	4.26	5.0	4.01	4.22	3.92	4.38	4.32	4.23	a
2.....	4.33	3.55	3.98	4.00	4.7	3.96	4.48	4.5	4.05	4.18	4.45	a
3.....	3.85	3.51	3.85	4.18	4.6	4.18	4.25	3.98	3.88	4.80	4.6	a
4.....	3.74	3.50	3.59	4.40	4.42	4.40	4.08	3.91	3.92	4.32	4.7	a
5.....	3.69	3.46	3.60	4.20	4.28	3.98	3.92	3.78	3.96	4.16	5.9	3.72
6.....	3.70	3.42	4.02	8.7	4.19	3.96	4.18	3.67	4.10	4.50	5.2	3.72
7.....	3.82	3.42	4.08	6.3	4.12	3.94	4.24	3.69	4.20	5.3	4.9	4.28
8.....	3.90	3.46	3.84	5.05	4.01	3.93	4.35	3.68	3.98	5.35	4.7	4.38
9.....	3.94	6.2	3.77	a	4.7	4.16	a	3.69	3.88	4.95	4.5	4.04
10.....	3.94	5.15	3.69	a	4.40	4.65	4.6	3.67	4.00	4.85	4.35	3.98
11.....	3.92	4.9	3.61	a	4.5	3.99	4.26	3.66	3.99	5.7	4.38	3.88
12.....	3.95	4.85	3.52	a	4.35	3.98	4.5	3.65	3.96	7.0	4.5	3.76
13.....	3.93	4.7	3.51	4.32	4.30	3.88	4.08	3.64	3.98	5.25	4.5	3.72
14.....	4.04	3.98	4.28	4.18	4.00	4.27	4.6	3.65	3.94	4.95	4.46	3.74
15.....	3.95	3.88	3.85	4.26	3.98	4.8	4.06	3.66	4.18	4.65	4.42	a
16.....	3.82	3.70	3.76	4.10	3.94	4.5	3.96	3.64	3.96	4.55	4.35	4.6
17.....	3.74	3.64	4.08	3.98	3.94	4.43	3.94	3.66	4.10	4.6	4.5	4.14
18.....	3.72	3.60	4.45	4.28	4.35	4.23	3.92	3.69	5.6	4.8	5.3	4.39
19.....	3.70	3.54	4.5	4.18	5.5	3.98	3.79	3.71	4.9	5.6	4.75	3.78
20.....	3.63	3.50	4.10	4.28	5.1	4.30	3.75	3.74	4.55	4.6	4.6	4.02
21.....	3.58	3.55	4.40	4.44	4.7	4.20	3.74	3.82	4.8	4.55	4.38	3.92
22.....	3.58	3.52	4.47	4.36	4.45	4.35	3.75	3.78	4.7	4.47	5.7	3.82
23.....	3.54	3.52	4.38	4.22	4.32	4.8	3.78	3.70	4.42	4.43	5.9	3.90
24.....	3.50	3.52	4.36	4.15	4.22	4.7	4.30	3.69	4.28	4.55	5.15	3.83
25.....	3.48	3.50	4.45	4.00	4.18	4.6	3.98	3.71	4.26	4.5	4.75	3.48
26.....	3.48	3.53	4.55	4.13	4.22	a	3.91	3.76	4.34	4.33	4.7	3.55
27.....	3.38	3.52	5.1	4.33	4.17	4.10	3.82	3.76	4.42	4.22	4.5	3.72
28.....	3.44	3.50	4.65	4.22	4.15	4.15	3.78	3.78	7.6	4.24	4.32	4.22
29.....	3.40	3.54	4.32	4.22	4.13	4.5	3.80	.....	5.5	4.33	4.12	4.08
30.....	3.61	3.53	4.19	5.0	4.18	4.55	3.78	.....	4.65	4.28	3.92	3.88
31.....	3.85	3.53	.....	5.6	.....	4.55	3.82	.....	4.48	.....	3.83	.....

a No record.

Daily discharge, in second-feet, of AUSABLE RIVER AT AUSABLE FORKS, during the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	345	250	1,230	903	2,270	599	851	340	1,070	984	864	380
2.....	998	196	507	588	1,620	546	1,230	320	645	870	1,180	360
3.....	436	170	436	800	1,440	800	890	320	465	955	1,440	340
4.....	336	164	221	1,100	1,130	1,100	679	309	505	964	1,620	320
5.....	294	142	227	825	929	567	505	300	546	776	4,480	319
6.....	302	121	611	14,300	813	546	460	280	702	1,260	2,720	319
7.....	407	121	679	5,600	727	526	400	204	825	2,950	2,050	829
8.....	484	142	426	2,380	599	515	380	287	567	3,070	1,620	1,070
9.....	526	5,310	362	1,440	1,620	776	340	294	465	2,160	1,260	634
10.....	526	2,600	294	929	1,100	1,530	320	280	588	1,940	1,030	567
11.....	505	2,050	234	727	1,260	578	320	272	578	3,950	1,070	465
12.....	536	1,940	177	727	1,030	567	300	264	546	7,740	1,260	354
13.....	515	1,620	170	984	955	465	340	257	567	2,840	1,260	319
14.....	634	567	929	800	588	916	703	264	526	2,160	1,200	336
15.....	536	465	436	903	567	1,830	550	272	800	1,530	1,130	1,200
16.....	407	302	354	714	526	1,260	440	257	546	1,350	1,030	1,440
17.....	336	257	679	567	526	1,150	470	272	702	1,440	1,260	751
18.....	319	227	1,180	929	1,030	864	380	294	3,690	1,830	2,950	1,090
19.....	302	189	1,260	800	3,440	567	360	311	2,050	3,690	1,730	371
20.....	250	164	702	929	2,490	955	345	336	1,350	1,440	1,440	611
21.....	214	196	1,100	1,160	1,620	825	336	407	1,830	1,350	1,070	505
22.....	214	177	1,210	1,040	1,180	1,030	345	371	1,620	1,210	3,950	407
23.....	189	177	1,070	851	984	1,830	371	302	1,130	1,150	4,480	484
24.....	164	177	1,040	764	851	1,620	955	294	929	1,350	2,600	417
25.....	153	164	1,180	588	800	1,440	567	311	903	1,260	1,730	153
26.....	153	183	1,350	739	851	955	494	354	1,010	998	1,620	196
27.....	102	177	2,490	998	788	702	407	354	1,130	851	1,260	319
28.....	132	164	1,530	851	764	764	371	371	9,790	877	984	851
29.....	110	189	984	851	739	1,260	388	.....	3,440	998	727	679
30.....	234	183	813	2,270	800	1,350	371	.....	1,530	929	505	465
31.....	436	183	.....	3,690	.....	1,350	360	.....	1,230	.....	417	.....
Mean...	358	612	798	1,640	1,130	961	489	306	1,360	1,830	1,680	555

NOTE.— Stage-discharge relation affected by ice, January 6 to 19 and January 31 to February 5. Daily discharge for these periods is approximate. Daily discharge estimated, June 1 to 4 and 15 to 18, by comparing with hydrograph of Saranac river near Plattsburg.

Monthly discharge of AUSABLE RIVER AT AUSABLE FORKS, for the year ended June 30, 1919

[Drainage area, 444 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	998	102	358	0.806	0.93
August.....	5,310	121	612	1.38	1.59
September.....	2,490	170	798	1.80	2.01
October.....	14,300	567	1,610	3.69	4.25
November.....	3,440	526	1,130	2.55	2.84
December.....	1,830	465	961	2.16	2.49
January.....	1,230	300	489	1.10	1.27
February.....	407	257	306	0.689	0.72
March.....	9,790	465	1,360	3.06	3.53
April.....	7,740	776	1,830	4.12	4.60
May.....	4,480	417	1,680	3.78	4.36
June.....	1,440	153	555	1.25	1.40
The year.....	14,300	102	977	2.20	29.99

WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN

Location.—On farm of James Dudley, about 4 miles northeast of Newman, Essex county, and 4 miles below confluence at Lake Placid.

Drainage area.—116 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—June 7, 1916, to December 31, 1916, May 1, 1917, to June 30, 1917, and October 1, 1917, to December 31, 1917.

Gage.—Staff, in two sections, on the right bank near the residence of Mr. Dudley. Lower section is inclined, graduated from 1.0 foot to 6.5 feet; the upper section is vertical, graduated from 6.55 feet to 10.1 feet; read by Jesse Martin.

Discharge measurements.—Made by wading or from cable 300 feet above gage.

Channel and control.—Solid rock.

Extremes of discharge.—1916–1918: Maximum daily discharge recorded, 615 second-feet on June 12, 1917. Minimum daily discharge recorded, 32 second-feet on August 30, and September 13, 1916.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Daily discharge, in second-feet, of WEST BRANCH AUSABLE RIVER NEAR NEWMAN,
for the year ended June 30, 1916

DAY	June	DAY	June	DAY	June
1.....		11.....	136	21.....	174
2.....		12.....	190	22.....	159
3.....		13.....	174	23.....	144
4.....		14.....	174	24.....	129
5.....		15.....	159	25.....	122
6.....		16.....	159	26.....	129
7.....	166	17.....	240	27.....	114
8.....	144	18.....	240	28.....	206
9.....	144	19.....	198	29.....	144
10.....	144	20.....	190	30.....	159

Daily discharge, in second-feet, of WEST BRANCH AUSABLE RIVER NEAR NEWMAN,
for the year ended June 30, 1917

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	114	74	47	129	78	223					267	332
2.....	114	71	71	92	99	159					276	370
3.....	139	71	57	88	111	190					249	450
4.....	223	57	57	74	92	174					258	313
5.....	294	64	50	85	88	153					206	258
6.....	240	47	47	47	88	267					198	276
7.....	159	50	47	74	74	198					198	232
8.....	136	68	47	68	71	190					174	313
9.....	122	114	57	68	122	182					166	351
10.....	129	106	47	68	166	249					206	240
11.....	190	71	44	64	129	198					190	390
12.....	190	74	47	44	99	174					198	615
13.....	159	54	32	71	85	122					249	370
14.....	240	64	44	144	78	174					240	294
15.....	159	57	129	88	96	174					294	450
16.....	122	60	159	71	85	144					223	249
17.....	223	34	85	92	92	88					198	240
18.....	223	38	85	88	74	92					267	240
19.....	159	44	71	88	85	85					214	93
20.....	129	38	57	223	74	78					370	249
21.....	106	42	71	294	47	64					351	294
22.....	99	34	60	182	44	64					249	313
23.....	206	38	129	136	64	96					332	276
24.....	240	50	144	102	470	106					313	258
25.....	198	57	99	64	223	78					267	240
26.....	159	57	82	99	174	102					258	249
27.....	106	34	92	92	136	106					240	240
28.....	136	42	47	78	114	111					294	223
29.....	111	38	78	64	111	111					313	206
30.....	96	32	214	60	240	92					370	410
31.....	96	38		57		92					390	
Mean...	163	55.4	76.5	96.4	117	140					261	301

Daily discharge, in second-feet, of WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN, for the year ended June 30, 1918

DAY	Oct.	Nov.	Dec.	DAY	Oct.	Nov.	Dec.
1.....	129	294	61	16.....	223	63	68
2.....	136	232	65	17.....	152	86	79
3.....	122	190	58	18.....	129	68	72
4.....	159	182	65	19.....	129	86	91
5.....	206	166	63	20.....	276	114	91
6.....		206	106	21.....	206	86	93
7.....		159	129	22.....	182	82	93
8.....		122	144	23.....	136	93	68
9.....		129	114	24.....	129	91	52
10.....		106	114	25.....	182	86	39
11.....		105	105	26.....	174	86	58
12.....		96	96	27.....	198	58	63
13.....		276	72	28.....	370	58	65
14.....		159	52	29.....	276	79	86
15.....		166	86	30.....	595	63	45
				31.....	490		45
				Mean.....	197	109	64.5

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 209

Monthly discharge of WEST BRANCH AUSABLE RIVER NEAR NEWMAN, for the period
ended June 30, 1918
(Drainage area, 116 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
1916					
July.....	294	96	163	1.41	1.63
August.....	114	32	55.4	0.478	0.55
September.....	214	32	76.5	0.659	0.76
October.....	294	44	96.4	0.831	0.96
November.....	470	44	117	1.01	1.13
December.....	267	64	140	1.21	1.40
1917					
January.....					
February.....					
March.....					
April.....					
May.....	390	166	261	2.25	2.59
June.....	615	93	301	2.60	2.90
July.....					
August.....					
September.....					
October.....	595	86	197	1.70	1.96
November.....	294	52	109	0.940	1.05
December.....	93	39	64.5	0.556	0.64

SARANAC RIVER

DESCRIPTION

Saranac river rises in southeastern Franklin county and flows northeastward to a point near Cadyville and thence eastward into Lake Champlain at Plattsburg. The southern boundary of the basin is the Ampersand mountain range and the stream drains the north slope of the most elevated region of the state of New York. About 16.2 per cent of the upper drainage area is water-surface. The areas tributary to the river are shown in the following table:

Drainage areas of SARANAC RIVER *

LOCATION	Area	Total area
	<i>Square miles</i>	<i>Square miles</i>
Above Saranac lake State dam.....		157.50
Above Saranac Lake village.....	44.90	202.40
Above Franklin Falls.....	104.30	306.70
North branch, Saranac river.....	136.60	136.60
At junction, North branch.....		498.80
Above High Falls.....	19.60	518.40
Above Cadyville.....	74.60	593.00
Above Kent Falls.....	2.90	595.90
Above Morrisonville.....	2.00	597.90
Above Lozier dam.....	26.10	a 624.00
Above mouth.....	5.60	629.60

* From Bien's Atlas of New York. a The U. S. Geological Survey gives the total area above the Lozier dam, measured on the U. S. G. S. topographic maps, as 607 square miles.

The results of gagings of Saranac river at a station formerly maintained at Saranac lake are given in the Report of the State Engineer and Surveyor for 1903, supplement, pages 71-4.

In 1854 a timber dam was built below lower Saranac lake for the purpose of flooding logs. In 1899-1901 a masonry dam and lock were erected by the State at this point.

SARANAC RIVER NEAR PLATTSBURG

Location.—At the Indian rapids power-plant (formerly known as Lozier dam) of the Plattsburg Gas and Electric Company, about 6 miles above the mouth of the river at Plattsburg, Clinton county.

Drainage area.—607 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.— March 27, 1903, to June 30, 1919.

Gages.— Crest gage, a vertical staff on the angle of the wing wall at the end of the racks. Datum raised 0.76 foot, August 20, 1906.

Tail-race gage, a vertical staff spiked to timber-work dike between tail-race and river and about 50 feet below power-house. Records of kilowatt output are obtained by a wattmeter on switch-board at half-hour intervals.

An inclined staff gage at the cable station, about $\frac{1}{4}$ mile below the dam.

Discharge measurements.— Made from a cable at head of Indian rapids, $\frac{1}{4}$ mile below the dam. Low-water measurements made by wading under cable or in tail-race. Gages and wattmeters read by power-house operators.

Discharge rating.— Records include flow over concrete spillway 171.25 feet in crest length, a rating for which has been prepared by use of coefficients* derived from experiments made in the hydraulic laboratory of Cornell University on a model section of the dam; the discharge through two power units equipped with 300-kilowatt generators, which have been rated by current-meter measurements; and the discharge through two 5-foot waste-gates when open.

Occasional observations are made on the inclined staff gage at the cable as a check on the ratings of spillway and turbines.

Extremes of discharge.— Current year: Maximum daily discharge, 3,400 second-feet, April 12 and 13. Minimum daily discharge, 200 second-feet, August 4.

1908–1919: Maximum daily discharge recorded, 6,410 second-feet, April 20, 1914. Minimum daily discharge recorded, 90 second-feet, September 28, 1914.

Special study.— A portable water-stage recorder was operated at the cable for a short period in July, 1914. Mean daily discharge computed from its record compared very closely with mean daily discharge based on power-plant.

Ice.— The crest of the spillway is kept free from ice, so that the stage-discharge relation is not affected.

Regulation.— The lakes and ponds on the main stream and tributaries above the station comprise a water-surface area of

* Horton, R. E., Weir experiments, coefficients and formulas, U. S. Geological Survey, Water-Supply Paper 200, pages 98–100, 1907.

about 25.5 square miles. The actual storage afforded by these reservoirs has been largely increased by the State dam at Lower Saranac lake, the operation of which affects the distribution of flow throughout the year.

Accuracy.—Discharge over the spillway ascertained by applying to the rating table mean gage heights for 6-hour periods. Discharge through the turbines ascertained by applying to their ratings the mean kilowatt output and head for 12-hour periods. Results fairly good.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Conservation Commission. Gage height records and wattmeter readings furnished by Plattsburg Gas and Electric Company, Herbert A. Stutchbury, Superintendent.

Daily discharge, in second-feet, of SARANAC RIVER NEAR PLATTSBURG, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	700	350	420	1,060	2,300	1,220	920	660	1,160	1,550	1,350	1,180
2.....	700	290	470	920	2,100	920	1,040	580	860	1,300	1,350	1,200
3.....	620	300	390	840	2,000	1,220	1,120	540	800	1,400	1,350	1,000
4.....	580	200	370	760	1,950	1,220	1,120	560	800	1,300	1,500	1,020
5.....	700	250	360	720	1,850	1,160	920	600	1,050	1,300	2,250	1,000
6.....	620	310	390	3,000	1,600	920	760	600	960	1,550	2,500	860
7.....	900	290	620	3,100	1,160	820	720	620	920	2,500	2,150	940
8.....	740	220	600	3,000	1,350	840	920	620	960	3,000	2,200	920
9.....	540	520	600	2,600	1,400	1,040	960	520	1,020	2,600	1,950	820
10.....	840	780	580	2,350	1,450	1,000	760	580	1,040	2,350	1,700	700
11.....	780	900	580	2,050	1,350	980	800	540	1,100	2,350	1,550	680
12.....	720	1,180	560	1,750	1,160	1,000	780	540	1,000	3,400	1,700	700
13.....	740	1,220	620	1,550	1,020	1,040	980	540	1,060	3,400	1,500	620
14.....	440	1,180	700	1,450	1,040	1,120	660	440	880	2,900	1,300	600
15.....	700	940	600	1,250	960	1,700	940	560	860	2,500	1,220	780
16.....	580	720	600	1,180	1,020	1,700	740	540	960	2,300	1,240	780
17.....	400	620	560	1,000	1,020	1,350	940	560	940	2,700	1,240	1,020
18.....	480	520	640	1,160	1,160	1,300	840	540	1,650	2,450	1,900	940
19.....	580	600	900	1,300	2,400	1,100	680	460	2,350	2,250	1,650	840
20.....	580	390	900	1,100	2,060	1,080	720	500	2,100	2,300	1,400	780
21.....	460	480	1,080	1,300	1,950	1,100	720	520	2,400	1,950	1,450	740
22.....	540	500	1,220	1,200	1,900	980	680	600	2,500	1,750	1,550	540
23.....	580	490	1,040	1,160	1,850	1,300	840	560	2,300	1,600	2,600	720
24.....	520	490	1,020	1,160	1,700	1,550	800	700	2,100	1,500	2,200	700
25.....	1,140	430	1,200	1,300	1,600	1,160	900	540	2,000	1,450	2,060	660
26.....	840	420	1,300	1,350	1,450	1,550	800	620	1,850	1,400	1,600	520
27.....	600	370	1,600	1,550	1,220	720	880	600	1,900	1,500	1,600	580
28.....	370	360	1,600	1,250	1,350	1,120	780	580	2,100	1,300	1,400	560
29.....	400	420	1,250	1,200	1,400	1,100	780	.....	1,140	1,400	1,300	440
30.....	310	400	1,180	1,650	1,400	1,060	700	.....	1,900	1,450	1,240	580
31.....	310	380	.....	2,450	.....	860	700	.....	1,700	.....	1,160	.....
Mean...	613	533	798	1,540	1,540	1,140	835	565	1,430	2,020	1,650	781

GAGING OF STREAMS: LAKE ONTARIO BASIN 213

Monthly discharge of SARANAC RIVER NEAR PLATTSBURG, for the year ended June 30, 1919

[Drainage area, 607 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,140	310	613	1.01	1.16
August.....	1,220	200	533	0.878	1.01
September.....	1,600	360	798	1.31	1.46
October.....	3,100	720	1,540	2.54	2.98
November.....	2,400	960	1,540	2.54	2.83
December.....	1,700	720	1,140	1.88	2.17
January.....	1,120	660	835	1.38	1.59
February.....	700	440	565	0.931	0.97
March.....	2,500	800	1,430	2.36	2.72
April.....	3,400	1,300	2,020	3.33	3.72
May.....	2,600	1,160	1,650	2.72	3.14
June.....	1,200	440	781	1.29	1.44
The year.....	3,400	200	1,120	1.85	25.14

LAKE ONTARIO BASIN—MISCELLANEOUS MEASUREMENTS

Miscellaneous measurements in LAKE ONTARIO DRAINAGE BASIN, for the year ended June 30, 1919

DATE	Stream	Locality	Gage height	Discharge
1918			<i>Feet</i>	<i>Sec.-ft.</i>
July 12.....	Genesee river.....	Rochester.....	1.14	764
July 20.....	Genesee river.....	Rochester.....	1.20	675
July 27.....	Genesee river.....	Rochester.....	0.76	664
July 31.....	Genesee river.....	Rochester.....	0.60	666
Aug. 18.....	Genesee river.....	Rochester.....	0.49	597
Aug. 26.....	Genesee river.....	Rochester.....	0.40	512
Aug. 27.....	Canandaigua outlet.....	Alloway.....	403.78	55.9
Aug. 27.....	Canandaigua outlet.....	Alloway.....	403.85	58.5
Nov. 19.....	Canaseraga creek.....	Hermitage farm bridge.....	6.65	245
Nov. 19.....	Canaseraga creek.....	Hermitage farm bridge.....	6.61	258
Nov. 19.....	Canaseraga creek.....	Hermitage farm bridge.....	6.65	267
1919				
June 9.....	Erie canal.....	South Greece.....		532
June 9.....	Erie canal.....	South Greece.....		454
June 20.....	Erie canal.....	South Greece.....		431

HUDSON RIVER DRAINAGE BASIN

DESCRIPTION OF BASIN

The principal sources of the Hudson river lie in the wildest portion of the Adirondack mountains, in Essex county, north-eastern New York. A number of branches, any one of which might possibly be considered the main stream, form its upper waters; but if the highest collected and permanent body of water be assumed as the true head, then the source of the Hudson becomes Lake Tear-of-the-Clouds, which lies at an elevation of 4,322 feet above tide, in the center of the triangle formed by Mount Marcy, Skylight and Gray peaks.

The river flows rather irregularly southward until it reaches the northern boundary of Saratoga county, where it makes a sharp turn and flows eastward for about 12 miles, passing through the mountains and forming, as it cuts across the rocky strata, several falls of great height and beauty. At Hudson Falls, just below Glens Falls, it makes another abrupt turn and flows southward, continuing in this direction until it empties into New York bay.

From Lake Tear-of-the-Clouds to the mouth of the river the distance by water is probably about 300 miles. The total area drained is 13,366 square miles. The river is tidal to Troy, which is also at the head of navigation.

The headwater region is mountainous in character, is in general heavily wooded and is dotted with numerous lakes and ponds. The rocks, belonging to the oldest formation and mainly granitic, are either bare or covered only with a layer of spruce duff, humus and forest litter. The river emerges from the mountain region a few miles west of Glens Falls and from there to Troy the topography is moderately rolling and the soil is chiefly sand. Below Troy the river follows the great depression which extends almost due north and south between New York bay and the St. Lawrence, flowing in an open valley bordered by well-cultivated lands, which rise with moderate slope from the stream. The Catskill Mountain

region is reached 20 or 30 miles below Albany and thence to the mouth of the river the immediate valley is flanked by high hills, the Highlands of Orange county, and the precipitous Palisades being especially noticeable.

The fall in the upper portion of the course is very rapid, amounting to about 64 feet per mile from Lake Tear-of-the-Clouds to the mouth of North creek, a distance of about 52 miles. From the mouth of North creek to the mouth of the Sacandaga the descent is nearly 14 feet per mile, distributed among rapids which diminish in frequency as the Sacandaga is approached. In the succeeding 26 miles to Fort Edward the river descends 418 feet more. One hundred and seventy-five feet is comprised within the three abrupt pitches at Palmer, Glens, and Bakers Falls, while most of the remainder occurs in the rapids between Jessup's Landing and the oxbow above Glens Falls. Between Glens Falls and Troy nearly the entire fall of the river is utilized for the development of water-power. Between Fort Edward and Troy the Hudson river is canalized as part of the Barge canal system for practically the entire distance.

The tributaries of the Hudson are numerous and many of them are large and important. Indian river, Schroon river and the Sacandaga unite with the main stream above Glens Falls and between the latter point and Troy it receives Batten kill, Fish creek, Hoosic river and the Mohawk, the latter having several important tributaries, including West and East Canada and Schoharie creeks. The tributaries below Troy include Catskill, Esopus and Rondout creeks and Wallkill river from the west and Kinderhook creek, Jansen kill, Wappinger creek, Fishkill creek and Croton river from the east.

Below Troy the bed of the Hudson river is depressed below tide-water level. The stage of the stream is controlled by tidal action, by the inflow of the main stream and by the lateral drainage jointly.

The mean annual precipitation on the total basin of the Hudson is probably about 43 inches. It reaches a maximum of more than 55 inches in the heights of the Adirondacks, while in the

eastern portion of the drainage area, in southern Vermont, the mean annual total is only about 39 inches. Conditions during the winter period vary from the extreme cold and deep snow of the Adirondacks to the areas in the southern portion of the basin, which are subject to frequent winter thaws.

The flow of the upper Hudson is controlled to some extent during the dry season by the use of Indian lake storage reservoir. The natural storage facilities in the Adirondack region, tapped on the east and south by the upper Hudson and the Mohawk, are unsurpassed, there being a great many ponds and lakes, many of large size and fed from extensive drainage areas.

The longest run-off record in the Hudson river drainage basin is that obtained at the upper dam at Mechanicville, which extends back to 1888.

HUDSON RIVER

In the following pages will be found tables giving the daily discharge and monthly run-off of the Hudson river above Troy and of its tributaries at a considerable number of locations. These records are derived from various sources, which are indicated for records other than those maintained by this Department.

As to records of the Hudson river and tributaries it can only be said at this time that they are probably more consistent than would appear from a direct comparison. In some cases where the recorded run-off per square mile at adjacent stations differs, it does not necessarily follow that either one of the records is incorrect. There are wide variations in the hydrological conditions in different portions of the upper Hudson drainage basin. For example, the topography, culture, geology and soil for the Hudson and its tributaries above North Creek are all essentially different from the corresponding features of the drainage basin of Saratoga lake outlet. The hydrological features of both the above mentioned basins are essentially different from the corresponding features of the drainage basins of the Batten kill and Hoosic river. The conditions are somewhat further complicated by

diversions from the Hudson river to supply the Champlain canal through Glens Falls feeder and at Northumberland dam.

The Hudson river has been canalized for the Barge canal between Troy and Fort Edward with the exception of short distances at Stillwater and Northumberland and between the Fort Miller and Crocker's reef dams, where the canal is located on the east bank for a distance of about 2.5 miles. Four existing dams and three new ones, together with the necessary dredging, create a series of pools with low-water navigable surfaces at elevations, referred to Barge canal datum, as follows:—

Above the new Federal dam at Troy, Elev. 15.2.—The old State dam at Troy has been removed, having been replaced by the new Federal dam, completed November 18, 1915, about 1,400 feet further upstream. The old State dam was a timber crib dam with a straight fixed crest about 1,080 feet long at an elevation averaging 13.5 (12.6 M. S. L.) on which flash-boards were usually maintained to Elev. 15.2 (14.3 M. S. L.). The new dam built by the Federal Government and located at the foot of Bond street is a concrete structure of the ogee type. The crest has a broken trace and consists of two main arms, one two feet higher than the other. The east and lower section abuts on the new lock and lies across and normal to the main channel, with a crest length of 586 feet at Elev. 15.2 (14.33 M. S. L.). Provision is made in this lower crest for the use of flash-boards two feet in height. The west and higher section extends obliquely downstream to an ice-pass adjacent to the power head-gates on the west bank. The crest of the higher section is 669 feet long and at Elev. 17.2 (16.33 M. S. L.). The ice-pass, which is in line with the head-gates and parallel to the east section of the dam, provides an opening for the passage of ice, drift, etc., 25.5 feet wide, above Elev. 12.70 (11.83 M. S. L.), which will ordinarily be closed by flash-boards below crest of dam.

Above new dam No. 1, north of Waterford, Elev. 29.5.—This dam, located about 2.9 miles north of or upstream from the Waterford-Troy bridge across the Hudson river, consists of a concrete ogee crest totaling 602.5 feet at Elev. 29.5, having a

broken trace made up of two arms. The one adjacent and normal to Barge canal lock No. 1 on the right, or west bank is 100 feet long, the other, 502.5 feet in length, inclines downstream, and abutting it on the outer end is a battery of six Taintor gates, each having a clear span of 50 feet with sills at Elev. 15.0 lying normal to the direction of stream flow.

Above the lower dam at Mechanicville, Elev. 48.0.—This is an old dam now used by the Adirondack Electric Power Corporation.

Above the upper dam at Mechanicville, Elev. 67.5.—This is the old dam now used by the West Virginia Pulp and Paper Company, also known as the Duncan dam.

Above the old dam at Stillwater, Elev. 83.5.

Above the old dam at Northumberland, Elev. 102.5.—The river above the old dam at Fort Miller is not canalized.

Above the new dam at Crocker's reef, Elev. 119.0.—This dam is a concrete structure with a straight ogee crest in two sections. The east crest is 480 feet long and the west crest is 280 feet long, a total crest length of 760 feet at Elev. 119.0. This dam has an exceptionally level crest. There are no gates or power-wheels at this location and the entire flow of the river except that portion which is utilized for canal purposes at the Fort Miller lock and in the old Champlain canal, passes over the crest of the dam.

HUDSON RIVER NEAR INDIAN LAKE

Location.—About 1 mile below the mouth of Cedar river, $1\frac{1}{2}$ miles above the mouth of Indian river and 6 miles northeast of Indian Lake village, Hamilton county.

Drainage area.—418 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—August 30, 1916, to June 30, 1919.

Gage.—Gurley printing water-stage recorder on right bank; inspected by John A. Bolton.

Discharge measurements.—Made from cable about 100 yards below gage or by wading.

Channel and control.—Solid ledge overlain with coarse gravel; probably permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 8.70 feet, from 2 to 4 P. M., April 12; discharge, 10,400 second-feet. Minimum stage from water-stage recorder, 1.58 feet at 3 to 5 P. M., August 31; discharge, 96 second-feet.

1916–1919: Maximum stage from water-stage recorder, 9.87 feet at 11 A. M., June 12, 1917; discharge, 13,500 second-feet. Minimum stage from water-stage recorder, 1.43 feet, from 11 A. M., September 11, to 8 A. M., September 13, 1916; discharge, 56 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Large diurnal fluctuation due to logging operations during the spring months. Seasonal distribution of flow is slightly affected by storage.

Accuracy.—Stage-discharge relation practically permanent; affected by logs or ice from July through April. Rating curve fairly well defined between 75 and 600 second-feet and well defined between 600 and 6,000 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, except when fluctuation required mean or hourly discharge. Records good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of HUDSON RIVER NEAR INDIAN LAKE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
1918			
July 14.....	J. W. Moulton.....	2.78	696
Oct. 25 <i>a</i>	E. D. Burchard.....	3.12	956
1919			
Jan. 14 <i>b</i>	E. D. Burchard.....	2.94	389
Feb. 12 <i>b</i>	E. D. Burchard.....	2.47	240
Mar. 12 <i>b</i>	J. W. Moulton.....	3.64	585
Apr. 5.....	M. H. Carson.....	3.29	1,160
May 8.....	M. H. Carson.....	4.70	2,920
May 8.....	M. H. Carson.....	5.59	4,100
June 19.....	C. C. Covert.....	2.46	495

a A few logs on control.

b Ice on control.

Daily discharge, in second-feet, of HUDSON RIVER NEAR INDIAN LAKE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	313	216	195	1,100	2,480	850	800	300	240	1,500	2,000	1,150
2.....	524	229	224	932	2,600	750	700	280	260	1,200	2,000	665
3.....	482	234	336	810	2,220	700	700	280	280	1,000	2,000	488
4.....	562	211	290	735	1,750	600	650	280	300	800	2,000	416
5.....	595	195	252	735	1,440	550	600	240	280	1,000	2,000	399
6.....	500	187	247	772	1,240	562	550	240	360	1,290	2,000	372
7.....	428	171	379	1,120	1,060	735	550	240	460	1,750	2,000	491
8.....	383	167	434	3,490	932	772	500	240	440	2,470	2,000	700
9.....	351	175	372	3,660	810	735	480	240	420	2,510	1,630	630
10.....	356	238	305	2,600	772	630	440	240	480	3,360	1,770	476
11.....	405	440	247	1,860	772	665	400	200	550	5,250	1,200	394
12.....	530	440	211	1,540	772	850	380	220	550	9,490	1,200	367
13.....	665	367	203	1,340	700	890	380	200	500	6,400	1,200	336
14.....	735	315	211	1,340	665	700	380	200	500	5,270	1,200	315
15.....	735	252	199	1,060	630	595	360	220	420	2,630	4,010	367
16.....	595	238	224	777	562	975	400	240	400	2,960	4,210	508
17.....	530	183	280	595	530	1,060	500	220	400	4,000	1,930	772
18.....	500	157	361	530	595	1,100	380	260	460	2,750	2,100	735
19.....	446	146	688	506	1,200	1,290	280	240	900	2,000	2,700	506
20.....	399	142	772	494	1,800	1,290	320	220	1,100	1,890	1,930	388
21.....	356	135	735	476	1,920	850	260	220	1,100	2,820	1,560	325
22.....	315	128	810	562	1,700	665	220	220	1,000	1,560	1,620	534
23.....	276	132	772	824	1,390	890	180	220	950	1,160	2,760	665
24.....	247	125	700	1,240	1,100	1,290	280	240	800	1,650	3,780	512
25.....	229	122	770	1,200	890	1,340	600	260	650	1,740	2,260	305
26.....	211	115	735	975	735	1,390	600	280	600	3,890	2,200	284
27.....	191	109	1,060	890	630	1,240	480	280	700	1,470	2,200	382
28.....	171	102	1,290	975	562	1,150	400	260	1,600	1,360	2,200	470
29.....	160	102	1,290	1,060	750	1,020	340	.....	1,100	2,520	2,200	351
30.....	203	102	1,240	975	900	950	320	.....	2,400	2,100	2,200	810
31.....	247	105	.....	1,060	.....	850	300	.....	1,900	.....	2,200	.....
Mean...	408	193	528	1,170	1,140	901	443	241	713	2,650	2,120	485

NOTE.—Stage-discharge relation affected by ice, December 30 to March 30. Daily discharge for this period is approximate. Daily discharge estimated, October 1, November 29 to December 5, March 31 to April 5, April 30, May 18 and 19 and June 1. Estimated mean daily discharge: 2,000 second-feet, May 1 to 8; 1,100 second-feet, May 11 to 14; 2,200 second-feet, May 25 to 31. Discharge estimated by comparing with hydrograph of Hudson at North Creek minus Indian river at Indian Lake.

Monthly discharge of HUDSON RIVER NEAR INDIAN LAKE, for the year ended June 30, 1919

[Drainage area, 418 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	735	160	408	0.976	1.13
August.....	440	102	193	0.462	0.53
September.....	1,290	195	528	1.26	1.41
October.....	3,660	476	1,170	2.80	3.23
November.....	2,600	530	1,140	2.73	3.05
December.....	1,390	550	901	2.16	2.49
January.....	800	180	443	1.06	1.22
February.....	300	200	241	0.577	0.60
March.....	2,400	240	713	1.71	1.97
April.....	9,490	800	2,650	6.34	7.07
May.....	4,210	1,100	2,120	5.07	5.84
June.....	1,150	234	485	1.16	1.29
The year.....	9,490	102	916	2.19	29.63

HUDSON RIVER AT NORTH CREEK

Location.—At the two-span steel highway bridge in the village of North Creek, Warren county, immediately above the mouth of North creek.

Drainage area.—804 square miles.

Records available.—September 21, 1907, to June 30, 1919.

Gage.—Chain, at upstream side of left span of the bridge; read by William Alexander.

Discharge measurements.—Made from the upstream side of the highway bridge.

Channel and control.—Heavy gravel; fairly permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 8.50 feet at 7.30 A. M., April 12; discharge, about 13,800 second-feet. Minimum stage recorded, 2.25 feet at 8 A. M., July 24; discharge, 302 second-feet.

1907-1919: Maximum stage recorded, 12.0 during the evening of March 27, 1913; discharge, about 30,000 second-feet. Minimum stage, 2.05 feet at 7:05 A. M., September 30, 1913; discharge, 169 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—The numerous lakes and ponds in the basin of the upper Hudson have a decided effect on the low-water flow, especially the reservoir at Indian lake. Many of the reservoirs are used to make flood waves in the spring in connection with log-driving.

Accuracy.—Stage-discharge relation practically permanent; usually affected by ice from December to March, inclusive. Rating curve well defined between 250 and 6,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good during open-water period; fairly good during period when stage-discharge relation is affected by ice.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of HUDSON RIVER AT NORTH CREEK, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 13.....	J. W. Moulton.....	3.76	1,770
1919			
Jan. 14.....	E. D. Burchard.....	2.75	665
Feb. 10 a.....	E. D. Burchard.....	3.31	1,160
May 9.....	O. W. Hartwell.....	5.46	4,710
May 9.....	O. W. Hartwell.....	4.69	3,280

a A little shore ice on control.

Daily gage height, in feet, of HUDSON RIVER AT NORTH CREEK, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.42	2.9	3.1	3.3	5.0	3.4	3.2	3.2	3.2	4.5	4.6	4.1
2.....	2.7	2.9	3.15	3.2	4.6	3.3	3.15	3.2	3.25	4.2	3.4	3.6
3.....	2.65	2.9	3.2	3.25	4.3	3.2	3.4	3.2	3.3	4.0	4.4	3.75
4.....	2.85	2.9	3.05	3.05	4.3	3.2	3.25	3.15	3.45	3.9	4.2	3.1
5.....	2.9	3.25	2.9	3.05	4.0	3.1	3.1	3.1	3.4	3.7	5.2	2.8
6.....	2.8	3.1	2.9	3.45	3.5	3.0	3.1	3.1	3.3	3.7	5.5	2.7
7.....	2.7	3.0	3.0	5.2	3.3	2.9	3.0	3.25	3.1	4.6	3.95	2.6
8.....	2.6	2.9	3.1	5.3	3.3	2.9	3.0	3.4	3.1	5.0	5.6	3.1
9.....	2.6	3.05	3.2	4.7	3.25	2.85	2.9	3.4	3.1	4.9	5.2	3.0
10.....	2.6	3.1	3.1	4.0	3.2	2.8	2.8	3.4	3.1	5.5	4.6	2.9
11.....	2.7	3.2	3.1	3.8	3.2	2.8	2.85	3.25	3.15	7.0	3.65	2.7
12.....	2.85	3.2	3.05	3.6	3.2	2.8	2.8	3.3	3.1	8.4	3.75	2.6
13.....	3.75	3.1	3.0	3.5	3.1	2.8	2.8	3.3	3.05	6.7	3.7	2.6
14.....	3.6	3.1	3.0	3.4	3.0	2.8	2.75	3.25	2.9	5.6	3.9	2.6
15.....	3.6	3.0	2.8	3.2	2.95	2.95	2.8	3.3	2.9	5.0	3.8	2.8
16.....	3.15	2.95	2.6	3.25	2.9	3.3	2.8	3.25	2.85	5.3	4.6	2.9
17.....	3.05	3.0	2.65	3.2	2.85	3.3	3.0	3.2	2.85	6.4	4.0	3.5
18.....	3.0	2.9	2.7	3.2	3.0	3.2	2.9	3.25	2.85	5.8	4.4	3.2
19.....	2.85	3.0	3.1	3.1	3.9	3.2	2.7	3.25	3.4	4.6	4.6	3.05
20.....	2.7	3.1	3.2	3.1	4.3	3.1	2.7	3.25	3.7	4.4	4.4	2.8
21.....	2.7	3.1	3.2	3.0	4.3	3.1	2.85	3.3	4.0	4.8	4.2	2.7
22.....	2.6	3.0	3.1	3.2	4.2	3.1	3.2	3.2	4.6	4.9	4.7	2.8
23.....	2.30	3.05	3.1	3.4	3.9	3.2	3.3	3.15	4.6	4.8	5.7	2.8
24.....	2.28	3.05	3.0	3.45	3.65	3.8	3.4	3.2	4.7	4.8	6.1	2.9
25.....	2.8	3.0	3.0	3.3	3.5	3.85	3.6	3.3	4.4	4.4	5.7	2.7
26.....	2.9	3.0	3.05	3.2	3.3	3.85	3.7	3.2	4.2	4.9	5.4	2.75
27.....	2.75	3.0	3.6	3.2	3.2	3.7	3.5	3.15	4.9	4.4	5.6	2.85
28.....	2.8	3.0	3.7	3.4	3.2	3.4	3.5	3.2	5.6	4.3	4.7	3.15
29.....	2.8	3.0	3.65	3.4	3.2	3.3	3.4	.....	5.6	5.1	4.2	2.8
30.....	2.9	2.95	3.5	3.35	3.4	3.25	3.3	.....	5.5	4.6	4.0	2.7
31.....	3.0	2.95	.....	4.7	.....	3.2	3.25	.....	5.0	.....	3.7	.....

Daily discharge, in second-feet, of HUDSON RIVER AT NORTH CREEK, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	404	790	990	1,220	4,010	1,350	1,100	1,100	1,100	3,050	3,230	2,370
2.....	610	790	1,040	1,100	3,230	1,220	1,040	1,100	1,160	2,530	1,350	1,620
3.....	570	790	1,100	1,160	2,700	1,100	1,350	1,100	1,220	2,210	2,870	1,840
4.....	745	790	940	940	2,700	1,100	1,160	1,040	1,420	2,060	2,530	980
5.....	790	1,160	790	940	2,210	990	990	990	1,350	1,760	4,440	700
6.....	700	990	790	1,420	1,480	890	990	990	1,220	1,760	5,120	610
7.....	610	890	890	4,440	1,220	790	890	1,160	990	3,230	2,140	700
8.....	530	790	990	4,660	1,220	790	890	1,350	990	4,010	5,360	990
9.....	530	940	1,100	3,420	1,160	745	790	1,350	990	3,810	4,440	890
10.....	530	990	990	2,210	1,100	700	700	1,350	990	5,120	3,230	790
11.....	610	1,100	990	1,910	1,100	700	745	1,160	1,040	9,100	1,690	610
12.....	745	1,100	940	1,620	1,100	700	700	1,220	990	13,900	1,840	530
13.....	1,840	990	890	1,480	990	700	700	1,220	940	8,240	1,760	530
14.....	1,620	990	890	1,350	890	700	655	1,160	790	5,360	2,060	530
15.....	1,620	890	700	1,100	840	840	700	1,220	790	4,010	1,910	700
16.....	1,040	840	530	1,160	790	1,220	700	1,160	745	4,660	3,230	790
17.....	940	890	570	1,100	745	1,220	890	1,100	745	7,400	2,210	1,480
18.....	890	790	610	1,100	890	1,100	790	1,160	745	5,840	2,870	1,100
19.....	745	890	990	990	2,060	1,100	610	1,160	1,350	3,230	3,230	940
20.....	610	990	1,100	990	2,700	990	610	1,160	1,760	2,870	2,870	700
21.....	610	990	1,100	890	2,700	990	745	1,220	2,210	3,810	2,530	610
22.....	530	890	990	1,100	2,530	990	1,100	1,100	3,230	3,810	3,420	700
23.....	380	940	990	1,350	2,060	1,100	1,220	1,040	3,230	3,810	5,600	700
24.....	319	940	890	1,420	1,690	1,910	1,350	1,100	3,420	3,610	6,600	790
25.....	700	890	890	1,220	1,480	1,980	1,620	1,220	2,870	2,870	5,600	610
26.....	790	890	940	1,100	1,220	1,980	1,760	1,100	2,630	3,810	4,840	655
27.....	655	890	1,620	1,100	1,100	1,760	1,480	1,040	3,810	2,870	5,360	745
28.....	700	890	1,760	1,350	1,100	1,350	1,480	1,100	5,360	2,700	3,420	1,040
29.....	700	890	1,690	1,350	1,100	1,220	1,350	.....	5,360	4,220	2,530	700
30.....	790	840	1,480	1,280	1,350	1,160	1,220	.....	5,120	3,230	2,210	610
31.....	890	840	.....	3,420	.....	1,100	1,160	.....	4,010	.....	1,760	.....
Mean...	764	912	1,010	1,610	1,650	1,110	1,020	1,160	2,020	4,280	3,800	886

NOTE.— Stage-discharge relation not affected by ice.

Monthly discharge of HUDSON RIVER AT NORTH CREEK, for the year ended June 30, 1919

[Drainage area, 804 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,840	319	764	0.950	1.10
August.....	1,160	790	912	1.13	1.30
September.....	1,760	530	1,010	1.28	1.41
October.....	4,660	890	1,610	2.00	2.31
November.....	4,010	745	1,650	2.05	2.29
December.....	1,980	700	1,110	1.38	1.59
January.....	1,760	610	1,020	1.27	1.46
February.....	1,350	990	1,150	1.43	1.49
March.....	5,360	745	2,020	2.51	2.89
April.....	13,800	1,760	4,280	5.32	5.94
May.....	6,600	1,350	3,300	4.10	4.73
June.....	2,370	530	886	1.10	1.23
The year.....	13,800	319	1,643	2.04	27.74

HUDSON RIVER AT THURMAN

Location.—At the Delaware & Hudson Railroad bridge near the Thurman railroad station, Warren county, about $\frac{1}{2}$ mile below the mouth of Schroon river and about 13 miles above the mouth of Sacandaga river.

Drainage area.—1,550 square miles.

Records available.—September 1, 1907, to June 30, 1919.

Gage.—Chain, at upstream side near center of left span; read by S. H. Spencer.

Discharge measurements.—Made from the upstream side of the bridge.

Channel and control.—Sand and gravel; fairly permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 8.25 feet at 9 A. M., April 12; discharge, 18,600 second-feet. Minimum stage recorded, 2.4 feet at 9 A. M., July 28; discharge, 460 second-feet.

1907–1919: Maximum stage, 12.5 feet during the late evening of March 27, 1913, determined by leveling from flood marks; discharge, about 46,000 second-feet. Minimum stage recorded, 2.12 feet at 8:55 A. M. and 6:20 P. M., September 30, 1913; discharge, about 290 second-feet.

Ice.—Stage-discharge relation affected by ice. Winter discharge determined from records at North Creek and Riverbank.

Regulation.—Discharge is regulated to some extent by the storage reservoirs at Indian lake and Schroon lake and the mills on the Schroon river.

Accuracy.—Stage discharge relation practically permanent; usually affected by ice during large part of the period from December to March, inclusive. Rating curve well defined between 550 and 20,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results good. Estimated results during frozen period fairly good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission. Gage heights furnished by the International Paper Company.

GAGING OF STREAMS: HUDSON RIVER BASIN 225

Discharge measurements of HUDSON RIVER AT THURMAN, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 12.....	J. W. Moulton.....	2.82	985
Oct. 26.....	E. D. Burchard.....	3.41	1,980
Nov. 15.....	E. D. Burchard.....	3.38	2,030
1919			
Feb. 13 a.....	E. D. Burchard.....	4.75	1,470
Mar. 13 b.....	J. W. Moulton.....	4.12	2,050
May 10.....	M. H. Carson.....	4.43	4,460

a Nearly complete ice cover on control. b Partial ice cover on control.

Daily gage height, in feet, of HUDSON RIVER AT THURMAN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.7	2.9	3.0	3.4	5.1	3.75	3.45	3.8	5.7	5.2	4.1	4.0
2.....	3.05	2.8	3.05	3.15	4.8	3.6	3.7	3.9	5.1	4.9	3.9	3.95
3.....	3.15	2.85	3.0	3.0	4.6	3.6	3.65	3.9	4.6	4.8	4.1	3.7
4.....	2.8	2.8	3.0	3.05	4.4	3.6	3.65	4.0	4.8	4.9	4.2	3.7
5.....	2.9	3.05	2.8	3.1	4.3	3.5	3.4	4.1	4.8	4.5	5.7	3.4
6.....	2.9	2.95	2.8	3.25	4.1	3.4	7.0	4.0	4.9	4.5	4.8	3.1
7.....	2.8	2.9	2.8	4.3	3.95	3.45	7.9	4.0	4.4	5.0	4.7	3.05
8.....	2.8	2.9	2.8	5.1	3.85	3.4	7.9	4.0	4.2	5.2	4.5	3.2
9.....	2.7	2.9	3.1	4.7	3.7	3.3	7.3	4.0	4.0	5.5	5.7	3.45
10.....	2.7	2.9	3.0	4.2	3.6	3.3	6.3	4.0	4.6	5.8	4.2	3.4
11.....	2.7	2.85	2.95	3.85	3.6	3.25	6.5	4.0	4.5	6.4	4.0	3.3
12.....	2.65	3.05	2.95	3.75	3.45	3.2	5.8	4.0	4.3	8.2	4.8	3.25
13.....	3.3	3.0	2.9	3.75	3.35	3.4	6.0	4.4	4.3	7.0	4.2	3.15
14.....	3.5	2.95	3.05	3.65	3.35	3.35	6.1	5.0	4.0	6.5	4.4	3.3
15.....	3.5	2.95	3.4	3.5	3.3	3.55	5.8	4.8	3.8	6.0	4.0	3.05
16.....	3.3	2.85	2.6	3.05	3.35	3.6	5.8	4.7	3.8	5.7	4.2	3.2
17.....	3.05	2.8	2.65	3.0	3.3	3.7	5.9	4.1	3.8	6.0	4.1	3.8
18.....	3.0	2.65	2.9	3.3	3.35	3.6	5.6	4.0	4.0	6.2	4.8	3.5
19.....	3.0	2.75	2.95	3.1	4.3	3.4	5.2	5.0	4.0	5.4	5.1	3.4
20.....	3.0	2.9	3.1	3.05	4.5	3.35	4.7	5.2	4.1	4.9	4.8	3.35
21.....	2.85	3.0	3.35	2.95	4.6	3.3	4.7	5.3	4.4	5.1	4.6	3.15
22.....	2.7	2.8	3.2	3.15	4.5	3.35	5.2	5.9	4.8	5.0	4.8	3.1
23.....	2.65	2.9	3.1	3.3	4.8	3.5	5.6	5.3	4.8	4.8	5.9	3.1
24.....	2.6	2.95	3.1	3.5	4.2	3.8	5.8	5.0	4.8	4.9	6.2	3.1
25.....	2.6	3.0	3.0	3.5	4.0	3.8	5.6	4.9	4.8	4.2	6.0	3.1
26.....	2.9	2.85	3.1	3.45	3.85	4.0	5.8	4.8	4.7	4.7	5.8	2.9
27.....	2.75	2.85	3.75	3.35	3.7	4.0	5.9	4.4	4.7	4.7	5.9	3.35
28.....	2.4	2.8	3.7	3.45	3.65	3.85	5.4	5.3	6.2	4.6	5.4	3.25
29.....	2.9	2.85	2.6	3.45	3.65	3.55	5.3	.....	5.7	4.9	4.8	3.1
30.....	2.9	2.85	3.55	3.5	3.7	3.5	4.7	.....	5.9	4.4	4.6	3.0
31.....	3.0	2.8	.....	4.6	.....	3.3	4.4	.....	5.6	.....	4.3	.....

Daily discharge, in second-feet, of HUDSON RIVER AT THURMAN, for the year ended
June 30, 1919

[Day] k	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	850	1,220	1,380	2,010	6,460	2,780	2,120			6,780	3,610	3,360
2	1,300	1,080	1,460	1,530	5,540	2,440	2,660			5,840	3,120	3,240
3	1,500	1,150	1,380	1,280	4,950	2,440	2,550			5,540	3,610	2,660
4	1,950	1,080	1,380	1,380	4,390	2,440	2,550			5,840	3,860	2,660
5	1,100	1,460	1,080	1,440	4,120	2,220	2,010			4,670	8,440	2,010
6	1,100	1,300	1,080	1,720	3,610	2,010				4,670	5,540	1,440
7	950	1,220	1,080	4,120	3,240	2,120				6,150	5,240	1,360
8	950	1,220	1,080	6,460	3,000	2,010				6,780	4,670	1,620
9	850	1,220	1,550	5,240	2,660	1,810				7,780	8,440	2,120
10	850	1,220	1,380	3,860	2,440	1,810				8,790	3,860	2,010
11	850	1,150	1,300	3,000	2,440	1,720				11,000	3,360	1,810
12	800	1,460	1,300	2,780	2,120	1,620				18,400	5,540	1,720
13	1,700	1,380	1,220	2,780	1,910	2,010				13,300	3,860	1,530
14	2,200	1,300	1,460	2,550	1,910	1,910				11,400	4,390	1,810
15	2,200	1,300	2,150	2,220	1,810	2,330				9,500	3,360	1,360
16	1,700	1,150	850	1,360	1,910	2,440				8,440	3,860	1,620
17	1,300	1,080	905	1,280	1,810	2,660				9,500	3,610	2,890
18	1,300	905	1,220	1,810	1,910	2,440				10,200	5,540	2,220
19	1,200	1,020	1,300	1,440	4,120	2,010				7,430	6,460	2,010
20	1,200	1,220	1,550	1,360	4,670	1,910				5,840	5,540	1,910
21	1,000	1,380	2,040	1,200	4,950	1,810				6,460	4,950	1,530
22	850	1,080	1,740	1,530	4,670	1,910				6,150	5,540	1,440
23	800	1,220	1,550	1,810	4,120	2,220				5,540	9,140	1,440
24	750	1,300	1,550	2,220	3,860	2,890				5,840	10,200	1,440
25	850	1,380	1,380	2,220	3,360	2,890				3,860	9,500	1,440
26	1,220	1,150	1,550	2,120	3,000	3,360				5,240	8,790	1,130
27	1,020	1,150	2,800	1,910	2,660	3,360				5,240	9,140	1,910
28	680	1,080	2,600	2,120	2,350	3,000				4,950	7,430	1,720
29	1,220	1,150	2,400	2,120	2,550	2,330				5,840	5,540	1,440
30	1,220	1,150	2,200	2,220	2,660	2,220				4,390	4,950	1,280
31	1,380	1,080		4,950		1,810					4,120	
Mean...	1,160	1,200	1,530	2,390	3,310	2,290				7,380	5,650	1,870

NOTE.— Discharge, July 1 to 24 and September 27 to 30, somewhat uncertain because of logs on the control. Stage-discharge relation affected by ice, January 6 to March 31.

Monthly discharge of HUDSON RIVER AT THURMAN, for the year ended June 30, 1919
[Drainage area, 1,550 square miles]

MONTH	DISCHARGE IN SECOND-FEET				Run-off Depth in inches on drainage area
	Maximum	Minimum	Mean	P. r square mile	
July	2,200	680	1,160	0.748	0.86
August	1,460	905	1,200	0.774	0.99
September	2,800	850	1,530	0.987	1.10
October	6,460	1,200	2,390	1.54	1.78
November	6,460	1,810	3,310	2.14	2.39
December	3,360	1,620	2,290	1.48	1.71
January			1,960	1.26	1.45
February			1,710	1.10	1.14
March			3,950	2.55	2.94
April	18,400	3,860	7,380	4.76	5.31
May	10,200	3,120	5,650	3.66	4.21
June	3,360	1,130	1,870	1.21	1.35
The year			2,867	1.85	25.13

NOTE.— Mean discharge for the period, January 6 to March 31, determined by comparison with sum of records at North Creek and Riverbank.

HUDSON RIVER AT CORINTH

Gage No. 129

This station was established October 1, 1906, and is maintained in coöperation with the United States Weather Bureau. It is located at the mouth of Sturdevant creek on the right bank of the Hudson river about $\frac{1}{4}$ mile upstream from the highway bridge across the Hudson river in the village of Corinth.

On June 26, 1917, a standard Type A gage, No. 129, was secured to the north abutment of an abandoned highway bridge at the mouth of the creek, replacing the gage secured to the south abutment of the same bridge. The gage has a range of 14 feet and the datum is arbitrary.

It is read twice daily — at about 8 A. M. and 5 P. M. — to tenths.

Daily gage height, in feet, of HUDSON RIVER AT CORINTH, for the year ended June 30, 1919. E. H. Bowker, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	0.4	0.0	0.5	1.45	3.8	1.45	2.1	2.55	2.55	4.55	2.5
2.....	0.5	0.2	0.85	1.05	3.75	1.3	2.2	2.5	2.85	4.0	2.6
3.....	0.5	0.3	1.0	0.8	3.55	1.3	2.3	2.5	3.05	3.6	2.95
4.....	0.5	0.3	0.7	0.7	3.1	1.55	2.3	2.5	3.2	3.35	3.15
5.....	0.4	0.3	0.3	0.55	2.75	1.9	2.2	2.45	3.2	3.1	3.45
6.....	0.4	0.3	0.4	1.3	2.55	2.3	1.8	2.25	3.2	3.35	3.6
7.....	0.4	0.3	0.3	2.2	2.35	2.1	1.65	2.2	2.9	3.65	3.35
8.....	0.4	0.3	0.3	2.9	2.0	2.05	1.7	2.1	2.2	4.0	3.1
9.....	0.3	0.3	0.25	2.6	1.75	2.25	1.75	2.2	2.15	4.35	3.85
10.....	0.3	0.3	0.2	2.35	1.7	2.45	1.95	2.2	2.5	4.65	3.25
11.....	0.3	0.45	0.3	1.8	1.8	2.2	2.2	2.2	2.75	5.2	3.15
12.....	0.3	0.6	0.3	1.6	1.7	2.3	2.2	2.3	2.65	7.0	3.35
13.....	0.3	0.45	0.3	1.35	1.35	2.65	2.2	2.4	2.6	7.05	3.4
14.....	0.45	0.35	0.3	1.15	1.15	2.9	2.35	2.5	2.35	6.35	3.4
15.....	0.5	0.3	0.3	0.95	1.1	3.15	2.4	2.5	2.2	5.7	3.1
16.....	0.6	0.3	0.2	0.75	1.1	3.3	2.55	2.35	2.35	5.35	3.0
17.....	0.8	0.3	0.2	0.55	1.2	3.2	2.85	2.2	2.65	5.15	2.9
18.....	0.8	0.3	0.2	0.5	1.35	3.15	2.9	2.35	2.85	4.7	3.05
19.....	0.8	0.3	0.3	0.5	2.3	2.9	2.85	2.4	2.8	4.3	3.1
20.....	0.8	0.3	0.45	0.65	3.0	3.05	2.75	2.4	3.0	4.05	3.1
21.....	0.65	0.3	0.65	0.85	3.1	3.2	2.7	2.5	3.5	3.75	3.15
22.....	0.45	0.3	0.7	1.05	3.0	3.35	2.75	2.5	4.0	3.85	3.45
23.....	0.1	0.3	0.55	1.25	2.7	3.55	2.85	2.4	4.1	3.8	4.5
24.....	0.5	0.3	0.5	1.4	2.55	3.75	3.2	2.3	4.2	3.65	5.0
25.....	0.75	0.3	0.6	1.05	2.2	3.95	3.5	2.3	4.1	3.3	5.05
26.....	0.8	0.3	0.9	0.9	1.95	4.0	3.5	2.15	4.45	3.3	4.6
27.....	0.3	0.3	1.9	1.0	1.6	3.75	3.45	2.0	4.9	3.15	4.4
28.....	0.75	0.3	2.2	1.0	1.6	3.45	3.4	2.1	5.6	2.8	4.1
29.....	0.4	0.4	1.95	1.15	1.6	2.9	3.1	.....	5.45	3.15	3.45
30.....	0.1	0.25	1.7	1.3	1.6	2.5	2.85	.....	5.2	3.0	2.9
31.....	0.0	0.2	.....	2.2	.....	2.0	2.75	.....	4.95	.....	2.45

NOTE.— Station discontinued, May 31, 1919.

HUDSON RIVER AT SPIER FALLS

Location.—One-half mile below the Spier Falls dam, Saratoga county, and $11\frac{1}{2}$ miles below mouth of Sacandaga river.

Drainage area.—2,800 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—October 7, 1912, to June 30, 1919.

Gage.—Gurley 2-day water-stage recorder, in brick shelter, 5 feet square, on the right bank. Recorder inspected by R. F. Malone, chief operator of the power-plant.

Discharge measurements.—Made from a cable about 1,000 feet down-stream from the gage.

Channel and control.—Bed composed of coarse gravel and boulders; probably permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 11.64 feet at 1 A. M. and 6 A. M., April 13; discharge, 32,000 second-feet. Minimum stage, 0.94 foot at 5 A. M. and 7 A. M., September 1, 1918; discharge, 140 second-feet.

1912-1919: Maximum stage from water-stage recorder, 18.59 feet, at 12:25 A. M., March 28, 1918; discharge, about 89,100 second-feet. Minimum stage, -0.12 foot at 4 P. M., September 23, 1917, observed during current-meter measurement; discharge, about 5.5 second-feet.

Ice.—Stage-discharge relation not affected by ice except for a short time during extremely cold periods.

Regulation.—Large diurnal fluctuation in discharge, due to operation of the Spier Falls power-plant. Seasonal flow affected by storage at Indian lake and many small lakes and reservoirs in the upper part of the drainage basin.

Diversions.—Water is diverted from Hudson river through the Glens Falls feeder and the old Champlain canal into the summit level of the Barge canal. A portion flows north into Lake Champlain. No correction has been made for this diversion.

Accuracy.—Stage-discharge relation practically permanent; rating curve well defined for all stages except at about 9 feet, where curve may be 4 per cent or 5 per cent large. Operation of the water-stage recorder satisfactory throughout the year. Daily discharge ascertained by averaging the results obtained by applying

gage heights for one-hour intervals to the rating table. Records good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission. Water-stage recorder inspected by an employee of the Adirondack Electric Power Corporation.

Discharge measurement of HUDSON RIVER AT SPIER FALLS, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919 May 11.....	O. W. Hartwell.....	Feet 5.99	Sec.-ft. 8,380

Daily discharge, in second-feet, of HUDSON RIVER AT SPIER FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,810	1,480	908	4,070	12,600	4,940	5,230	3,190	2,070	15,700	7,480	5,900
2.....	1,700	1,540	1,940	3,700	12,200	4,810	6,080	2,810	3,790	13,200	8,500	6,280
3.....	2,780	1,120	2,350	2,780	11,000	3,880	6,570	3,230	4,150	11,300	9,120	4,480
4.....	1,580	1,380	1,790	3,290	9,780	4,170	6,480	2,880	4,250	10,400	9,880	4,220
5.....	1,260	1,530	1,690	2,750	8,570	4,020	4,480	2,860	5,030	9,680	12,000	3,910
6.....	1,510	1,490	1,650	2,210	7,510	3,700	3,980	2,980	5,530	9,810	11,400	2,760
7.....	1,510	1,670	1,530	4,810	6,430	2,670	3,810	2,990	5,850	11,600	12,600	2,310
8.....	1,910	1,430	922	8,320	6,240	1,670	4,050	2,180	5,070	13,700	9,230	1,640
9.....	1,480	1,590	1,980	7,340	4,620	4,280	4,030	2,160	5,570	15,600	13,500	3,170
10.....	1,250	1,060	2,060	5,900	4,430	2,700	3,900	3,420	7,820	16,200	9,150	3,080
11.....	1,410	1,600	1,700	4,500	4,420	2,980	3,150	2,660	7,820	19,800	8,900	3,080
12.....	1,850	1,710	1,420	4,100	5,250	2,420	2,900	2,270	7,210	29,400	9,530	3,060
13.....	2,080	1,580	1,770	3,780	3,770	2,940	3,240	2,330	7,320	30,900	9,910	2,650
14.....	2,690	1,680	1,850	3,930	3,490	3,400	2,250	2,540	6,200	26,700	9,290	2,360
15.....	8,600	1,570	725	3,480	3,230	3,500	3,040	2,120	5,500	22,100	9,040	1,380
16.....	2,380	1,540	1,970	2,920	3,500	5,380	2,820	1,710	4,990	18,000	8,350	3,190
17.....	2,470	1,050	1,360	2,440	2,730	5,720	3,200	3,240	4,760	18,800	8,400	3,370
18.....	2,410	1,230	1,410	2,310	3,940	5,250	3,010	2,740	5,230	18,700	9,420	3,830
19.....	2,730	1,810	1,950	2,460	7,600	4,680	2,700	2,430	7,600	15,400	11,800	3,310
20.....	2,240	1,450	2,410	1,620	9,700	4,280	2,500	2,170	9,080	14,300	10,500	3,000
21.....	1,400	1,380	3,390	2,470	9,770	3,400	2,300	2,720	11,200	12,700	9,260	2,460
22.....	1,690	1,430	1,600	3,590	8,960	3,410	2,640	1,700	13,500	12,600	10,700	1,820
23.....	1,480	1,440	2,810	3,630	7,940	5,500	2,850	1,400	13,900	9,780	16,300	2,760
24.....	1,310	606	2,240	4,370	6,910	6,700	4,040	2,740	14,400	10,100	18,100	2,100
25.....	1,380	1,410	2,220	3,740	6,060	9,290	4,700	2,300	14,800	8,940	18,500	1,920
26.....	1,440	1,690	2,620	4,050	5,190	12,100	5,030	2,230	13,200	9,420	16,700	1,860
27.....	1,480	1,400	5,410	2,800	4,760	11,500	5,020	2,390	13,100	9,270	16,200	2,280
28.....	1,290	1,440	6,100	4,130	3,260	9,900	4,670	2,340	21,800	7,620	13,600	2,780
29.....	1,420	1,550	5,350	3,740	4,580	8,240	4,200	.....	20,300	8,430	10,900	3,800
30.....	1,590	1,200	4,650	4,240	4,720	6,540	3,940	.....	20,000	7,790	8,640	3,140
31.....	1,530	1,520	.....	7,230	.....	5,240	3,680	.....	18,300	.....	7,340	.....
Mean...	1,850	1,450	2,310	3,880	6,440	5,130	3,890	2,530	9,300	14,600	11,100	3,060

Monthly discharge of HUDSON RIVER AT SPIER FALLS, for the year ended June 30,
1919

[Drainage area, 2,800 square miles]

MONTH	DISCHARGE IN SECOND-Feet				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,690	1,250	1,850	0.661	0.76
August.....	1,880	606	1,450	0.518	0.60
September.....	6,100	725	2,310	0.825	0.92
October.....	8,320	1,620	3,880	1.38	1.59
November.....	12,600	2,730	6,440	2.30	2.57
December.....	12,100	1,670	5,130	1.83	2.11
January.....	6,570	2,250	3,890	1.39	1.60
February.....	3,420	1,400	2,530	0.904	0.94
March.....	21,200	2,070	9,300	3.32	3.83
April.....	30,900	7,620	14,600	5.21	5.81
May.....	18,500	7,340	11,100	3.96	4.56
June.....	6,280	1,390	3,060	1.09	1.22
The year.....	30,900	606	5,462	1.95	26.51

HUDSON RIVER AT VARNEY FARM, ABOVE GLENS FALLS

Gage No. 128

This station, established January 27, 1914, is located on the left bank of the Hudson river about 3 miles upstream from the feeder dam at Glens Falls. The gage, originally a vertical staff attached to a pine tree about 800 feet north of the fence running toward the river from the barn on the Varney farm, was replaced in November, 1916, by a standard Type A gage, No. 128, having a range of 12 feet, between elevations 281.0 and 293.0. A nail was driven in the tree at elevation 290.0 (B. C. datum) for a reference point.

The gage is read twice daily — morning and afternoon — to tenths.

GAGING OF STREAMS: HUDSON RIVER BASIN 231

Daily elevation of water-surfaces (B. C. datum) of HUDSON RIVER AT VARNY FARM, ABOVE GLENS FALLS, for the year ended June 30, 1919. Henry B. Palmer, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	a	282.75	283.6	285.5	287.45	285.8	285.65	284.7	282.3	287.7	285.5
2.....	a	283.0	284.75	285.15	287.45	285.7	286.05	283.0	a	287.6	285.65
3.....	a	282.55	285.65	284.3	287.25	285.25	286.2	283.95	a	287.0	285.65
4.....	a	282.95	285.05	284.7	286.95	285.35	286.15	283.4	a	286.65	285.85
5.....	a	283.8	284.4	284.1	286.55	284.85	285.5	283.2	a	286.5	286.75
6.....	a	283.55	283.3	282.5	286.35	283.6	a	283.35	a	286.45	286.35
7.....	a	283.55	283.4	285.75	286.15	282.6	a	283.35	a	286.8	286.8
8.....	a	283.95	282.4	286.35	285.95	281.95	a	283.15	a	286.35	285.6
9.....	a	284.1	284.2	286.2	285.45	284.6	285.25	281.95	a	286.7	287.15
10.....	a	283.6	285.0	285.75	284.9	283.15	284.85	283.4	a	287.85	286.25
11.....	a	283.3	284.1	285.35	284.5	282.75	284.6	283.9	286.35	288.3	285.7
12.....	a	285.05	283.75	284.5	285.1	282.0	283.7	282.85	286.4	290.15	285.85
13.....	a	284.95	283.15	283.7	284.3	282.1	283.55	281.95	286.15	290.45	286.0
14.....	a	284.55	284.05	284.7	283.1	282.7	282.75	282.95	286.05	289.65	285.75
15.....	a	284.2	283.05	284.55	284.5	283.2	283.2	282.35	285.85	288.7	286.1
16.....	a	284.15	284.35	284.65	284.95	285.8	283.65	281.5	285.65	287.75	285.5
17.....	a	283.55	283.45	283.75	282.9	286.05	284.0	282.0	285.7	287.9	285.7
18.....	a	282.95	282.45	283.3	285.35	285.85	283.9	282.95	285.75	287.95	285.7
19.....	a	284.6	283.05	283.0	286.1	285.6	283.7	282.95	286.3	287.05	285.5
20.....	a	284.15	283.95	282.95	286.7	285.1	284.15	281.95	286.7	286.85	285.3
21.....	a	283.6	285.3	283.75	286.9	284.35	283.3	281.85	287.25	287.5	285.7
22.....	a	283.4	283.85	283.95	286.75	282.95	283.0	281.75	287.8	286.55	286.3
23.....	a	283.8	283.4	284.95	286.45	285.8	283.1	281.95	287.75	286.15	287.7
24.....	282.0	282.9	282.95	285.45	286.2	286.2	283.65	282.25	287.6	285.7	288.3
25.....	283.2	282.6	283.55	284.85	285.95	286.55	284.7	282.65	287.95	285.4	288.75
26.....	284.4	284.25	284.95	284.05	285.8	287.25	285.65	282.7	287.55	285.6	288.25
27.....	285.3	283.75	285.9	281.75	285.4	287.3	285.85	282.3	287.5	285.65	288.2
28.....	284.8	283.8	286.25	285.45	283.5	287.2	285.65	282.3	288.8	285.3	287.8
29.....	284.55	283.7	286.15	284.2	285.8	286.45	285.45	.....	289.7	285.25	286.6
30.....	284.25	283.8	285.95	281.75	285.75	286.25	285.3	.....	288.6	285.35	285.6
31.....	283.45	283.55	.....	285.75	.....	285.75	285.0	.....	288.3	.....	284.4

Norm.—Station discontinued May 31, 1919. a Readings uncertain.

HUDSON RIVER AT GLENS FALLS

Gage No. 127

This station, located above the feeder dam at Glens Falls, was established March 9, 1905, and is maintained in coöperation with the U. S. Weather Bureau. A vertical staff on crib near left bank about 500 feet above dam is read to tenths twice daily—at 8 A. M. and 5 P. M.

In connection with the enlargement of the Glens Falls feeder to supply the summit level of the Champlain branch of the Barge canal system the feeder dam was reconstructed. A new concrete structure with an ogee crest at elevation 282.0 and 615 feet in length, including a logway 20 feet wide at elevation 280.0 with provision for flash-boards to crest, was built immediately below the old timber-crib dam, which had a very irregular crest averaging elevation about 281.0 and being about 618 feet long. There are large bulkheads for power purposes at each end of the dam.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE FEEDER DAM AT GLENS FALLS, for the year ended June 30, 1919. A. B. Fisher, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	283.0	283.4	283.65	285.4	287.05	285.6	285.55	284.65	281.8	286.95	284.55	283.9
2.....	282.35	282.8	284.75	284.95	287.05	285.7	286.0	283.8	283.85	286.05	284.75	284.1
3.....	283.55	282.75	285.7	284.25	286.75	284.95	285.95	283.85	285.1	286.35	284.75	283.6
4.....	284.5	282.5	285.05	284.4	286.65	284.9	286.05	283.55	285.3	286.2	285.05	283.55
5.....	283.05	284.0	284.45	284.7	286.4	284.3	285.85	283.45	285.55	286.25	285.4	284.2
6.....	282.5	283.7	283.8	282.4	286.25	283.25	285.4	283.55	285.75	286.1	285.3	284.25
7.....	282.0	283.4	283.4	285.7	286.0	283.45	285.0	283.4	285.85	286.35	285.65	283.8
8.....	283.95	283.75	283.05	286.25	285.85	281.6	285.2	282.75	285.7	286.65	284.85	283.6
9.....	283.25	284.1	284.15	286.1	285.6	284.4	285.2	281.35	285.65	287.0	285.85	284.7
10.....	281.25	283.85	284.95	285.6	284.25	283.15	284.7	283.5	286.25	287.1	285.15	284.95
11.....	282.25	283.35	284.1	285.15	284.45	281.85	284.65	283.7	286.25	287.4	285.05	284.85
12.....	283.15	285.1	283.85	284.25	284.9	281.35	283.55	282.55	286.15	286.25	284.95	283.6
13.....	283.5	284.95	282.95	283.7	284.4	282.2	282.95	282.25	286.15	286.0	285.2	284.4
14.....	283.95	284.55	284.1	284.05	282.85	283.15	283.45	282.1	285.95	287.55	285.0	283.85
15.....	285.85	284.04	283.2	284.35	284.25	282.9	283.25	281.95	285.8	286.9	285.15	283.05
16.....	285.55	284.1	284.2	284.65	284.85	285.7	283.9	281.4	285.6	286.3	284.9	284.5
17.....	284.85	283.85	283.35	283.8	282.9	285.9	283.85	282.8	285.85	286.4	284.95	283.15
18.....	284.3	282.95	282.1	283.25	284.95	285.8	283.65	283.1	285.8	286.4	284.9	285.75
19.....	283.85	284.65	282.85	283.0	285.8	285.6	283.65	282.7	286.25	285.9	285.5	285.55
20.....	284.45	284.15	283.5	282.45	286.55	285.45	283.8	281.75	286.35	285.7	285.35	284.85
21.....	283.45	283.6	285.2	283.85	286.65	284.15	283.0	282.25	286.75	285.5	285.15	283.7
22.....	283.6	283.3	283.45	284.0	286.45	283.1	282.6	281.55	287.2	285.55	285.3	282.9
23.....	283.05	283.65	283.4	284.7	286.25	285.65	283.0	281.0	287.25	284.95	286.15	284.3
24.....	282.75	283.45	282.8	285.35	286.0	286.15	284.3	281.85	287.35	284.95	286.5	284.15
25.....	283.8	282.65	282.75	284.9	285.9	286.6	285.45	281.9	287.35	284.75	286.05	285.5
26.....	284.55	284.3	283.7	283.95	285.7	287.05	285.4	282.0	287.1	284.8	286.35	283.6
27.....	284.85	283.85	285.65	282.15	285.3	286.95	285.55	282.15	287.05	284.9	286.25	283.95
28.....	285.05	283.5	286.2	285.35	283.7	286.65	285.45	282.1	286.85	284.45	285.9	283.2
29.....	284.5	283.65	285.95	284.65	285.65	286.3	285.25	.....	287.65	284.45	285.35	283.6
30.....	284.15	283.75	286.85	284.6	285.7	286.05	285.25	.....	287.6	284.75	284.75	284.6
31.....	282.9	283.65	.....	285.6	.....	285.75	285.05	.....	287.3	.....	284.3	.....

GLENS FALLS FEEDER AT GLENS FALLS

Location.—Slope station in upper end of canal.

Records available.—Continuous records from May 17 to June 30, 1919. Occasional current-meter measurements previous to 1919.

Gages.—Two Gurley 7-day water-stage recorders with scales of 2 to 1 for gage height. The float wells are 1½ by 2 feet, inside dimension, located with the bottoms about 2 feet below normal pool elevation. They are about 3½ miles apart. Gage No. 1 is located on the right bank just below the intake lock. Gage No. 2 is located on the left bank just below the highway bridge crossing to the cement mills. Both gages were inspected by Fred B. Kraft of the State Engineer's Department.

Discharge measurements.—Made from the first change bridge below intake to canal.

Regulation.—Flow in canal is regulated by gates at intake.

Ice.—No flow in canal during frozen season.

Accuracy.—The values of the coefficients as determined appear to be consistent. Daily discharge as computed is considered to fairly represent the facts. Except on some days when there is considerable diurnal fluctuation, results are believed to be good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of GLENS FALLS FEEDER AT GLENS FALLS, during the year ended June 30, 1919

DATE	Made by	GAGE HEIGHT		Discharge Sec.-ft.
		Gage No. 1	Gage No. 2	
1919		<i>Feet</i>	<i>Feet</i>	
May 21.....	J. W. Moulton.....	280.584	280.090	188
May 22.....	J. W. Moulton.....	280.568	279.995	185
May 23.....	J. W. Moulton.....	280.595	279.742	244
May 28.....	J. W. Moulton.....	280.497	279.948	184

Daily gage height, in feet, of GAGE NO. 1, GLENS FALLS FEEDER, AT GLENS FALLS, for the year ended June 30, 1919

DAY	May	June	DAY	May	June	DAY	May	June
1.....		280.516	11.....		281.034	21.....	280.540	281.094
2.....		280.554	12.....		281.044	22.....	280.526	281.070
3.....		280.604	13.....		281.054	23.....	280.502	281.136
4.....		280.520	14.....		281.076	24.....	280.444	281.316
5.....		280.766	15.....		281.132	25.....	280.482	281.324
6.....		280.880	16.....		281.336	26.....	280.410	281.360
7.....		280.880	17.....	280.566	281.180	27.....	280.400	281.480
8.....		280.876	18.....	280.470	281.218	28.....	280.398	281.390
9.....		280.968	19.....	280.658	281.180	29.....	280.578	281.436
10.....		280.958	20.....	280.604	281.186	30.....	280.620	281.430
						31.....	280.600	.....

Daily gage height, in feet, of GAGE NO. 2, GLENS FALLS FEEDER, AT GLENS FALLS, for the year ended June 30, 1919

DAY	May	June	DAY	May	June	DAY	May	June
1.....		279.778	11.....		280.06	21.....	279.962	279.994
2.....		279.760	12.....		280.06	22.....	279.936	279.974
3.....		279.848	13.....		280.06	23.....	279.858	279.990
4.....		279.682	14.....		280.10	24.....	279.796	280.098
5.....		279.906	15.....		280.158	25.....	279.842	280.176
6.....		280.084	16.....		280.246	26.....	279.706	280.166
7.....		280.09	17.....	279.784	280.052	27.....	279.688	280.300
8.....		280.08	18.....	279.914	280.118	28.....	279.670	280.084
9.....		280.07	19.....	280.074	279.978	29.....	279.962	280.340
10.....		280.03	20.....	280.010	279.996	30.....	279.94	280.178
						31.....	279.70	.....

HUDSON RIVER BELOW LOCK No. 7, FORT EDWARD

Gage No. 119

This station was originally established as "Hudson river at Bridge street, Fort Edward" and so maintained from April 11, 1904, to November 14, 1915, when it was discontinued and a new record begun at the Fort Edward canal terminal, about 550 feet farther upstream. On August 26, 1918, the gage, No. 119, was removed to lock No. 7, about $\frac{3}{4}$ mile downstream, and established in two sections on the east wall below the lock. It has a range of 14.5 feet. The limits are between elevations 119.0 and 127.0 for the lower section and between elevations 127 and 133.5 for the upper section. A standard bench-mark plug is set in the wall near the lower section at elevation 126.0 (B. C. datum).

The gage is read twice daily to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOCK No. 7, FORT EDWARD, for the year ended June 30, 1919. F. H. Wells and W. H. Newton, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	119.90	120.80	120.60	121.58	123.2	121.25	121.30	120.75	121.10	123.62	121.65	121.25
2.....	119.90	120.70	120.56	121.42	123.32	121.38	121.60	120.32	120.30	123.15	121.80	121.35
3.....	119.98	120.75	121.05	121.30	123.00	121.25	121.65	120.70	120.72	122.75	121.95	120.90
4.....	120.32	120.60	121.08	120.88	122.80	121.00	121.65	120.55	120.72	122.55	122.20	120.65
5.....	120.80	120.65	120.98	121.35	122.50	121.20	121.60	120.58	120.90	122.28	122.25	120.58
6.....	120.88	120.88	121.00	120.75	122.30	120.90	121.28	120.40	121.05	122.10	122.60	120.40
7.....	120.58	120.75	120.82	121.20	122.05	120.90	120.80	120.50	121.00	122.52	122.85	120.18
8.....	120.72	120.75	120.65	122.45	121.80	120.08	120.75	120.42	120.95	122.95	122.60	119.98
9.....	120.90	120.82	120.58	122.38	121.70	120.15	121.02	120.18	120.98	123.40	122.75	120.12
10.....	120.92	120.85	120.88	122.00	121.32	121.10	120.90	120.38	121.92	123.52	122.25	120.45
11.....	120.72	120.65	120.88	121.70	121.40	121.05	120.80	120.52	121.78	124.15	121.95	120.32
12.....	120.62	120.60	120.85	121.58	121.62	120.80	120.45	120.28	121.50	126.28	122.08	120.35
13.....	120.85	120.82	120.85	121.35	121.58	120.80	120.50	120.32	121.42	127.00	122.32	120.30
14.....	120.78	120.98	120.80	121.40	121.10	120.92	120.52	120.38	121.45	126.32	122.02	120.20
15.....	121.45	120.95	120.65	121.35	121.05	121.22	120.48	120.42	121.25	125.28	122.15	120.30
16.....	121.22	120.88	120.70	121.20	121.20	121.40	120.50	119.60	120.90	124.15	121.72	121.35
17.....	121.18	120.82	120.92	121.00	120.80	121.55	120.60	120.22	121.00	124.20	121.95	121.50
18.....	121.12	120.55	120.75	120.98	121.58	121.70	120.72	120.55	120.90	124.25	122.00	121.80
19.....	121.15	120.55	120.78	120.92	121.75	121.52	120.20	120.38	121.58	123.55	122.45	121.60
20.....	121.20	120.85	120.92	120.80	122.60	121.12	120.80	120.30	121.80	123.35	122.40	121.42
21.....	120.75	120.78	121.35	120.85	122.65	121.08	120.52	120.32	122.35	122.88	122.15	121.25
22.....	120.78	120.80	121.25	121.10	122.42	120.80	120.45	120.35	122.82	122.90	122.30	120.95
23.....	120.85	120.75	120.90	121.32	122.20	121.50	120.52	120.10	122.90	122.30	123.45	121.08
24.....	120.70	120.72	121.10	121.40	121.90	121.92	121.20	120.28	123.15	122.12	123.90	121.10
25.....	120.52	120.40	121.00	121.45	121.85	a	121.22	120.32	123.35	122.00	124.20	121.10
26.....	120.65	120.50	121.15	121.55	121.55	123.20	120.88	120.40	122.98	121.95	124.20	120.95
27.....	120.70	120.75	121.80	121.12	121.32	122.90	121.45	120.20	122.80	122.90	123.65	120.90
28.....	120.72	120.82	122.28	121.10	120.78	122.58	121.18	120.32	124.95	121.72	123.35	120.65
29.....	120.85	120.75	121.85	121.45	121.40	122.05	121.10	.....	124.60	121.60	122.52	121.52
30.....	120.90	120.75	121.90	121.38	121.35	122.20	120.95	.....	124.60	121.82	121.90	121.65
31.....	120.82	120.75	.....	121.80	.....	122.60	120.72	.....	124.30	.....	121.62	.....

a No record.

HUDSON RIVER AT CROCKER'S REEF DAM

Gage No. 118

Location.—At Crocker's reef dam across the Hudson river at the head of Thompson island about 6 miles below Fort Edward and about 2.2 miles above the dam at Fort Miller.

Drainage area.—2,959 square miles.

Records available.—Water-surface elevations, April 11, 1904, to June 30, 1919. Discharge, September 1, 1907, to June 30, 1918. Dam completed, August 27, 1907.

Gage.—The original gage was attached to an elm tree about 450 feet above the dam, on the east bank of the river. On July 17, 1915, a staff gage was located on the east side of the north end of the pier at the guard-gate and used until November, 1916, when it was replaced by a standard Type A gage, No. 118, which has a range of 12 feet, between elevations 118.0 and 130.0. A standard bench-mark plug is set in the pier near the gage at elevation 130.0 (B. C. datum). This gage indicates water-surface elevations practically equivalent to that at junction of canal and river, about 2,500 feet above, and is read twice daily to tenths— at 7 A. M. and 4 P. M. or 8 A. M. and 5 P. M.—and published in the accompanying table. From January 8, 1916, to November 30, 1916, the old gage on the elm tree was read once daily, simultaneously with a third reading of the guard-gate gage.

Discharge computations.—Discharge estimates are based on theoretical computations, using a varying coefficient and correcting for submergence. Velocity of approach has not been allowed for, as it was assumed that the surface slope from the gage to the dam would be approximately equivalent to the head due to velocity of approach.

Control.—Crest of dam at elevation 119.0, 760 feet long in two straight sections separated by head of island—the east, 480 feet, and the west, 280 feet in length. The dam is of concrete with an ogee crest carefully troweled to a uniform level for use as a gaging weir. This dam is free from gates or power-wheels. Dur-

ing higher stages the dam is submerged by backwater from the dam at Fort Miller.

Extremes of discharge.—1907–1918: Maximum stage recorded, on March 28, 1913, at 4 P. M.; discharge, 72,800 second-feet. A considerably higher stage is believed to have been reached earlier in the day. The 8:00 A. M. reading was not made. Minimum stage recorded, elevation 119.26 on June 19, 1913, at 7:00 A. M. and 5 P. M.; discharge, 280 second-feet.

Diversion.—During the navigation season water is diverted above this station to supply the new Barge canal lock at Fort Miller. Except for the above the entire flow of the Hudson river passes over the dam.

Regulation.—Daily flow affected somewhat by local storage above power dams at Fort Edward and Glens Falls.

Accuracy.—Discharge for current year has been reduced upon the same basis as used in former years. Allowance for submergence has been based upon estimated water-surface below the dam, and actual conditions as observed indicate that with about three feet of water over the dam there is somewhat more submergence than has been allowed. From July 26, 1915, to January 8, 1916, and since December 1, 1916, a correction, varying with the gage height, has had to be applied to records obtained at the guard-gate in the Barge canal, to obtain the water-surface elevation above the dam. This correction has been taken from a curve drawn by plotting the elevations at the guard-gate as abscissas and the difference between the simultaneous readings at the guard-gate gage and the river gage as ordinates.

GAGING OF STREAMS: HUDSON RIVER BASIN 237

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE CROCKER'S
REEF DAM, for the year ended June 30, 1919. John H. Donnelly, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	119.75	120.55	120.6	121.6	122.6	121.0	121.0	120.35	120.9	122.75	121.45	120.95
2.....	119.8	120.55	120.55	121.5	122.8	121.15	121.25	119.9	120.35	122.4	121.55	121.2
3.....	119.95	120.55	120.95	121.55	122.6	121.0	121.2	120.55	120.55	122.05	121.55	120.7
4.....	120.8	120.4	120.85	121.0	122.5	120.95	121.1	120.35	120.6	121.95	121.55	120.5
5.....	120.75	120.55	120.85	121.15	122.15	121.05	120.9	120.5	120.7	121.75	121.85	120.3
6.....	120.7	120.55	120.9	121.05	122.0	120.95	120.95	120.3	120.9	121.7	122.0	120.3
7.....	120.7	120.6	120.95	121.35	121.7	120.55	120.55	120.4	120.85	121.9	122.0	120.3
8.....	120.7	120.45	120.45	122.1	121.65	120.15	120.6	120.35	120.8	122.2	121.85	119.9
9.....	120.75	120.75	120.65	122.1	121.55	120.05	120.65	120.1	120.95	122.55	122.1	120.05
10.....	120.75	120.85	120.8	121.9	121.3	120.9	120.55	120.3	121.5	122.6	121.75	120.2
11.....	120.55	120.7	120.85	121.6	121.2	120.7	120.6	120.35	121.45	122.05	121.55	120.3
12.....	120.55	120.8	120.95	121.5	121.35	120.8	120.35	120.25	121.25	124.55	121.5	120.2
13.....	120.75	120.8	120.8	121.2	121.45	120.7	120.35	120.3	121.2	125.05	121.6	120.15
14.....	120.7	120.8	120.8	121.4	121.05	120.85	120.85	120.3	121.05	124.65	121.5	120.1
15.....	121.05	120.75	120.7	121.3	120.9	120.75	120.3	120.4	120.95	123.8	121.45	120.35
16.....	121.1	120.65	120.65	121.1	121.05	121.25	120.3	120.15	120.6	123.1	121.45	121.35
17.....	121.05	120.65	120.8	121.1	120.9	121.3	120.4	120.2	120.7	123.1	121.5	121.5
18.....	121.1	120.5	120.8	121.0	121.45	121.3	120.55	120.4	120.85	123.15	121.6	121.45
19.....	121.0	120.5	120.8	120.95	122.05	121.1	120.15	120.3	121.0	122.75	121.85	121.5
20.....	121.1	120.6	120.85	120.7	122.35	120.95	120.3	120.2	121.55	122.6	121.75	121.4
21.....	120.65	120.65	121.05	120.9	122.35	120.95	120.35	120.25	121.85	122.25	121.7	121.3
22.....	120.6	120.7	121.1	121.15	122.2	120.6	120.25	120.25	122.2	122.15	121.95	121.4
23.....	120.65	120.6	120.95	121.2	122.0	121.2	120.35	119.95	122.25	121.75	122.55	121.6
24.....	120.6	120.6	121.15	121.35	121.65	121.65	120.85	120.15	122.4	121.65	122.1	121.6
25.....	120.5	120.45	120.95	121.35	121.5	122.1	120.8	120.3	122.5	121.55	122.05	121.05
26.....	120.55	120.6	121.15	121.35	121.4	122.6	120.4	120.3	122.25	121.35	122.95	120.9
27.....	120.6	120.7	121.7	121.2	121.2	122.35	120.95	120.2	122.2	121.6	122.8	120.95
28.....	120.85	120.6	122.0	121.05	120.75	122.0	120.85	120.2	122.4	121.4	122.5	120.95
29.....	120.8	120.8	121.85	121.35	121.2	121.8	120.8	.....	123.45	121.35	122.0	121.25
30.....	120.85	120.75	121.55	121.35	121.2	121.7	120.75	.....	123.4	121.85	121.5	121.45
31.....	120.7	120.7	.....	121.5	.....	121.9	120.65	.....	123.15	.....	121.25	.....

HUDSON RIVER ABOVE DAM AT FORT MILLER

Gage No. 116

This station, established April 11, 1904, is located on the east bank of the Hudson river above the dam at Fort Miller. A board staff gage attached to a crib about 300 feet above the screen racks was transferred to the side wall of the head-race near the screen racks in 1913. In November, 1916, a standard Type A gage, No. 116, in two sections, was erected. The gage has a range of 12 feet, the lower section, attached to the side of the screen rack, reading from elevation 113.0 to elevation 121.0, and the upper section, attached to the side of the mill building, reading from elevation 121.0 to elevation 125.0. This dam has not been affected by Barge canal construction.

The gage is read twice daily—at 7 to 8 A. M. and 5 to 6 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM AT FORT MILLER, for the year ended June 30, 1919. W. L. Sanders, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	115.45	115.2	115.3	116.0	117.2	116.1	116.1	116.0	116.25	117.6	116.65	116.5
2.....	115.3	115.25	115.0	115.85	117.3	116.0	116.5	115.35	116.1	117.35	116.6	116.5
3.....	115.25	115.2	115.15	115.7	117.25	115.85	116.3	115.6	115.8	117.2	116.7	116.2
4.....	115.6	115.15	115.25	115.45	117.1	115.75	116.3	115.35	115.85	117.0	116.95	115.95
5.....	115.55	115.15	115.25	115.35	116.8	115.85	116.6	115.4	115.85	116.85	117.2	115.75
6.....	115.65	115.2	115.3	115.9	116.55	115.6	116.2	115.35	115.95	117.0	117.2	115.65
7.....	115.4	115.0	115.0	115.7	116.35	115.7	115.75	115.4	116.2	116.9	117.25	115.6
8.....	115.45	114.85	115.35	116.55	116.3	115.5	115.75	115.5	116.05	117.25	116.85	115.65
9.....	115.6	114.95	114.85	116.6	116.15	114.95	115.95	115.45	116.6	117.5	117.1	115.5
10.....	115.6	115.0	115.15	116.4	115.8	115.35	115.8	115.6	116.9	117.7	117.0	115.8
11.....	115.4	115.3	115.3	116.1	116.2	115.6	115.85	115.35	116.75	117.95	116.9	115.6
12.....	115.3	114.9	115.1	116.0	116.05	115.7	115.75	115.4	116.7	118.8	116.8	115.5
13.....	115.55	115.15	115.1	116.1	115.9	115.55	115.75	115.4	116.5	119.2	116.9	115.55
14.....	115.6	115.2	114.95	116.1	115.7	115.75	115.75	115.45	116.55	119.0	116.7	115.4
15.....	116.15	115.1	115.4	115.95	115.55	116.05	115.45	115.55	116.8	118.15	116.8	115.35
16.....	115.95	115.1	115.15	115.7	115.8	116.15	115.65	115.7	116.65	117.85	116.55	115.35
17.....	115.9	115.1	115.2	115.45	115.75	116.3	115.7	115.75	116.3	118.0	116.75	115.65
18.....	116.0	115.4	115.1	115.45	115.95	116.35	115.7	115.55	116.2	117.9	116.95	115.9
19.....	115.8	115.3	115.1	115.4	116.7	116.2	115.75	116.4	116.6	117.55	117.1	115.7
20.....	115.8	114.95	115.15	115.8	116.95	116.05	115.65	115.4	116.75	117.65	117.0	115.55
21.....	115.65	114.9	115.6	115.5	116.9	115.9	115.55	115.15	117.0	117.25	116.9	115.6
22.....	114.95	114.95	115.85	115.6	116.8	115.4	115.15	117.35	117.1	117.05	115.6	
23.....	115.4	114.9	115.4	115.9	116.75	116.2	115.45	115.4	117.55	116.85	117.5	115.4
24.....	115.4	114.95	115.45	116.05	116.7	116.5	116.05	115.15	117.45	116.9	117.85	115.4
25.....	115.45	115.5	115.3	115.9	116.45	116.95	116.0	115.35	117.4	116.85	118.0	115.2
26.....	115.35	114.75	115.45	116.0	116.3	117.2	116.2	115.45	117.2	116.7	117.9	115.3
27.....	115.4	114.85	116.25	116.1	116.05	117.1	116.0	115.4	117.1	117.0	117.65	115.05
28.....	115.4	114.95	116.45	115.7	115.65	116.8	116.0	115.35	118.2	116.7	117.45	115.35
29.....	115.45	115.4	116.5	115.9	115.9	116.9	115.9	.....	118.15	116.5	117.15	115.95
30.....	115.5	115.15	116.1	115.95	116.0	116.8	115.8	.....	118.2	116.65	116.85	115.9
31.....	115.4	114.8	.....	116.15	.....	116.85	115.75	.....	117.95	.....	116.55	.....

HUDSON RIVER BELOW DAM AT FORT MILLER

Gage No. 115

This station, established May 1, 1904, was originally located on the wall near the tail-race of the paper company, on the east bank of the river. From April, 1911, to November, 1916, it was located below Barge canal lock No. 6, on the third crib from the lower approach wall. On November 21, 1916, a standard Type A gage, No. 115, in two sections, was erected. The gage has a range of 15 feet, the lower section, attached to the return of the east lower approach wall of lock No. 6, reading between elevations 102.0 and 110.0, and the upper section, attached to the east abutment of the highway bridge over the lower end of lock No. 6, reading between elevations 110.0 and 117.0. A standard benchmark plug is set near the lower section at elevation 109.0 (B. C. datum) and an "H" cut in concrete beside the upper section at elevation 114.0 (B. C. datum).

The gage is read twice daily — at 7 to 8 A. M. and 5 to 6 P. M.— to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW DAM AT FORT MILLER, for the year ended June 30, 1919. W. L. Sanders, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	102.95	103.75	104.1	104.8	106.1	104.45	104.6	104.35	104.8	106.15	104.5	104.15
2.....	103.6	103.55	104.05	104.65	106.2	104.35	105.0	103.55	103.7	105.45	104.45	104.2
3.....	103.5	103.75	104.1	104.55	106.2	104.4	105.0	104.25	103.7	105.3	104.3	103.75
4.....	103.85	103.9	104.25	104.3	106.0	104.3	105.25	104.0	103.7	105.05	104.95	103.4
5.....	104.0	103.65	104.15	104.65	105.65	104.3	104.95	104.15	103.8	104.75	105.15	103.25
6.....	104.1	103.7	104.1	104.5	104.45	104.35	104.7	104.05	104.05	104.9	105.25	103.15
7.....	103.8	103.75	103.7	104.6	105.25	104.3	104.25	104.05	104.45	105.1	105.3	103.1
8.....	103.4	103.95	104.2	105.55	105.2	103.8	104.15	103.95	104.1	105.45	104.75	103.85
9.....	103.55	103.95	103.5	105.65	104.9	102.75	104.45	103.25	104.35	105.7	105.2	103.85
10.....	103.6	103.85	103.9	105.3	104.8	104.35	104.15	103.85	104.85	105.9	104.95	104.1
11.....	103.25	103.95	104.05	105.05	104.95	104.15	104.0	103.8	104.7	106.45	104.8	103.85
12.....	102.8	103.7	103.9	104.95	104.85	103.85	103.3	103.7	104.5	106.2	104.7	103.8
13.....	103.75	104.05	103.95	104.9	104.6	103.5	104.1	103.6	104.45	106.85	104.8	103.85
14.....	104.15	104.1	103.45	104.75	103.35	104.1	103.8	103.35	104.65	106.5	104.6	103.75
15.....	104.6	104.05	104.2	104.6	103.25	104.7	103.35	103.8	104.75	106.65	104.7	103.4
16.....	104.3	103.95	104.1	104.3	103.3	104.95	103.7	103.8	103.7	105.45	104.35	103.55
17.....	104.2	103.75	104.05	104.35	103.4	104.85	103.75	103.4	103.9	106.55	104.5	104.2
18.....	104.25	104.2	104.0	104.3	103.35	104.9	104.0	104.15	103.95	106.75	104.8	104.45
19.....	104.1	103.65	103.4	104.2	105.25	104.55	103.35	103.9	104.45	105.85	105.1	104.3
20.....	104.05	103.75	103.5	104.35	105.75	104.4	103.95	103.35	104.7	106.0	104.95	103.45
21.....	104.05	103.85	104.45	104.1	105.75	104.45	103.75	102.9	105.05	105.45	104.75	102.9
22.....	103.7	103.55	104.75	104.25	105.6	104.3	103.75	103.35	105.55	105.4	105.0	103.05
23.....	103.6	103.6	104.45	104.4	105.45	104.9	103.6	102.8	105.65	104.95	105.75	103.3
24.....	103.7	103.4	104.35	104.45	105.35	105.15	104.8	102.65	105.6	105.0	106.25	103.75
25.....	103.25	104.0	104.35	104.4	105.1	105.9	104.7	103.85	105.7	104.7	106.55	103.1
26.....	103.45	103.85	104.5	104.45	104.65	106.0	104.65	103.9	105.6	104.6	106.35	103.1
27.....	103.4	103.35	105.25	104.6	104.1	105.9	104.85	103.1	105.3	104.95	106.15	102.9
28.....	104.1	103.5	105.45	104.15	104.0	105.85	104.65	103.25	107.0	104.4	105.7	103.55
29.....	104.2	103.45	105.35	104.55	104.6	105.65	104.6	.....	106.95	104.25	105.2	104.4
30.....	104.2	103.35	105.1	104.4	104.25	105.3	104.5	.....	106.9	104.6	104.6	104.55
31.....	103.95	103.2	.....	104.75	.....	105.6	104.4	.....	106.6	.....	104.45	.....

HUDSON RIVER ABOVE LOCK No. 5, NORTHUMBERLAND

Gage No. 114

This station, established October 24, 1916, is located at the upper end of lock No. 5. Above lock No. 5 the canal follows a land-line for about one mile, entering the river above the dam at Northumberland. The water-surface indicated by this gage is practically that at the junction of the canal and river above the dam. The gage, No. 114, is a standard Type A gage, secured to the upper end of the east upper gate recess, and has a range of 11 feet, between elevations 100.0 and 111.0. A standard benchmark plug is set in the wall near the gage at elevation 110.0 (B. C. datum).

The gage is read twice daily — at 8 A. M. and 4 P. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE LOCK 5, NORTHUMBERLAND, for the year ended June 30, 1919. G. W. Perkins, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	103.05	104.20	104.12	104.42	105.82	104.42	104.42	104.28	104.72	105.55	104.18	104.05
2.....	103.15	103.40	104.15	104.65	105.92	104.65	104.75	103.88	103.40	105.18	104.15	103.95
3.....	102.95	103.78	104.30	104.55	105.88	104.05	104.72	104.25	103.65	104.92	104.30	103.55
4.....	104.15	104.08	104.28	104.39	105.68	104.22	104.72	104.12	103.52	104.78	104.70	103.15
5.....	104.02	103.98	104.02	104.55	105.43	104.38	104.58	104.05	103.70	104.62	104.60	103.30
6.....	104.10	103.78	104.08	104.50	105.28	104.15	104.50	104.00	103.80	104.68	104.88	103.18
7.....	103.98	103.80	103.70	104.58	105.15	104.25	104.02	104.10	103.95	104.78	104.98	102.82
8.....	103.28	103.70	104.12	105.50	104.95	103.78	104.00	104.05	103.70	105.05	104.48	103.98
9.....	103.58	103.70	103.35	105.52	104.82	102.62	104.15	103.48	104.08	105.30	104.78	103.50
10.....	103.48	103.72	103.92	105.15	104.88	104.40	104.05	103.82	104.62	105.35	104.60	103.90
11.....	103.08	104.15	104.05	104.92	104.88	103.80	103.98	104.15	104.40	105.72	104.52	103.68
12.....	102.68	103.80	103.85	104.78	104.82	103.85	103.42	103.45	104.22	106.88	104.35	103.90
13.....	103.62	104.02	103.88	104.82	104.55	103.55	103.62	103.50	104.30	107.42	104.65	103.95
14.....	104.30	104.10	103.28	104.70	103.05	104.05	103.68	103.12	104.32	107.05	104.40	103.60
15.....	104.48	104.08	104.22	104.55	103.00	104.35	103.12	103.65	104.55	106.42	104.58	104.05
16.....	104.42	103.85	104.00	104.35	102.92	104.75	103.68	103.65	103.85	105.89	104.25	103.60
17.....	104.15	103.82	104.10	104.30	103.60	104.78	103.62	103.58	103.75	105.78	104.32	103.75
18.....	104.22	104.20	104.05	104.22	103.15	104.68	103.88	104.12	103.60	105.88	104.48	104.40
19.....	104.08	103.62	103.40	104.28	105.00	104.60	103.60	103.85	104.22	105.45	104.75	104.10
20.....	104.02	103.72	103.60	104.35	105.52	104.32	103.90	103.55	104.28	105.62	104.68	103.10
21.....	104.25	103.72	104.35	104.25	105.55	104.40	103.52	103.05	104.70	105.10	104.45	102.60
22.....	103.62	103.40	104.85	104.15	105.55	104.25	103.45	103.62	105.02	105.00	104.65	103.15
23.....	103.60	103.35	104.15	104.28	105.30	104.72	103.68	103.10	105.25	104.65	105.25	103.00
24.....	103.75	103.38	104.40	104.42	105.28	105.05	104.62	102.42	105.28	104.58	104.60	103.88
25.....	103.08	104.10	104.28	104.50	105.00	105.60	104.52	103.78	105.30	104.48	105.90	103.20
26.....	103.52	103.25	104.50	104.48	104.28	105.82	104.55	103.90	105.08	104.32	105.65	103.28
27.....	103.42	103.40	105.00	104.55	104.22	105.72	104.70	103.22	104.98	104.62	105.42	102.90
28.....	104.20	103.78	105.30	103.95	103.95	105.55	104.50	103.25	106.12	104.30	105.25	103.58
29.....	104.08	103.30	105.18	104.45	104.32	105.48	104.48	.....	106.22	104.02	104.92	104.45
30.....	104.18	103.42	105.12	104.32	104.32	105.15	104.42	.....	106.10	104.32	104.48	104.48
31.....	104.05	103.25	.....	104.70	.....	105.65	104.32	.....	106.00	.....	104.20	.....

HUDSON RIVER BELOW LOCK No. 5, NORTHUMBERLAND

Gage No. 113

The concrete gage in the lock wall was read until November 19, when a standard Type A gage, No. 113, in two sections, was erected. The lower section is secured to the lower end of the east guide-wall and has a range of 12 feet, between elevations 82.0 and 94.0. The upper section is secured to the south end of the east lower thrust wall and has a range of 12 feet, between elevations 94.0 and 106.0. Standard bench-mark plugs are set in the wall near the gages, for the lower section at elevation 93.0 (B. C. datum) and for the upper section at elevation 97.0 (B. C. datum).

The gage is read twice daily—at 8 A. M. and 4 P. M.—to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOCK No. 5, NORTHUMBERLAND, for the year ended June 30, 1919. G. W. Perkins, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	84.18	83.85	83.62	85.40	87.52	85.25	86.20	85.18	86.15	89.40	86.50	86.05
2.	84.42	83.78	83.72	85.20	87.78	85.65	86.78	84.85	85.60	88.70	86.72	86.10
3.	84.20	83.70	84.30	85.08	87.30	85.25	86.48	85.10	85.68	88.10	86.90	85.55
4.	83.85	83.50	84.38	84.60	87.15	85.20	86.50	84.95	85.55	87.90	87.15	85.10
5.	84.32	83.35	84.20	85.00	86.68	85.88	86.40	84.95	85.68	87.62	87.62	85.10
6.	84.12	83.85	84.12	84.65	86.40	85.05	86.32	84.80	85.82	87.50	87.98	85.00
7.	83.65	83.82	83.98	84.38	86.10	85.25	85.98	84.85	85.72	88.02	88.05	84.55
8.	83.90	83.85	83.62	86.15	85.92	84.62	86.02	84.88	85.70	88.50	87.38	84.35
9.	84.20	83.95	83.45	86.40	85.78	84.45	85.90	84.62	85.88	88.92	87.65	84.55
10.	84.32	83.92	83.90	85.95	85.30	85.30	85.88	84.62	87.45	89.20	87.50	85.08
11.	84.05	83.95	84.15	85.65	85.12	85.00	85.82	84.92	86.98	87.75	87.02	84.85
12.	83.82	83.75	84.00	85.35	85.48	84.85	85.22	84.72	86.62	92.28	86.95	84.78
13.	84.00	84.20	84.05	85.12	85.45	84.65	85.35	84.52	86.42	93.68	87.45	84.80
14.	84.20	84.08	83.90	85.08	85.25	84.85	85.55	84.58	85.95	93.20	87.00	84.65
15.	84.60	84.08	83.80	85.10	84.55	85.20	85.02	84.72	85.82	91.58	87.10	84.40
16.	84.85	83.90	83.48	84.75	84.68	85.98	85.22	84.60	85.75	90.10	86.85	84.40
17.	84.68	83.95	84.10	84.68	84.72	85.80	85.08	84.65	86.08	90.00	86.88	84.58
18.	84.62	83.80	84.02	84.42	84.70	85.70	85.22	84.72	86.00	90.18	87.32	85.00
19.	84.48	83.70	83.82	84.40	86.62	85.50	84.92	84.62	86.10	89.88	87.70	84.92
20.	84.48	83.98	83.78	84.38	87.22	85.48	85.28	84.52	86.85	89.08	87.55	84.90
21.	84.18	84.08	84.35	84.40	87.22	85.32	85.00	84.28	87.50	88.38	87.08	84.60
22.	84.10	84.02	84.88	84.70	87.00	85.05	84.82	84.58	87.92	88.15	87.68	84.35
23.	84.05	84.00	84.32	84.82	86.65	86.02	84.85	84.32	88.12	87.58	88.90	84.28
24.	83.88	83.95	84.58	84.95	86.25	86.55	86.50	84.20	88.28	87.30	89.45	84.60
25.	83.60	83.80	84.32	85.18	86.20	87.30	86.05	84.50	88.48	87.30	89.70	84.32
26.	83.48	83.75	84.60	85.18	85.68	88.15	85.88	84.95	88.10	87.08	89.72	84.40
27.	83.72	83.85	86.28	84.85	85.35	87.98	86.22	84.75	87.95	87.22	89.08	84.22
28.	83.55	83.85	86.55	84.55	85.15	87.52	85.90	84.62	90.32	86.78	88.62	84.32
29.	84.10	83.85	85.92	84.22	85.30	86.92	85.65	.....	90.90	86.38	87.88	84.58
30.	84.18	83.70	85.78	85.00	85.38	86.82	85.52	.....	90.55	86.85	87.02	85.10
31.	83.98	83.75	.....	85.58	.....	86.90	85.25	.....	90.28	.....	86.45	.....

HUDSON RIVER AT FREE BRIDGE, LIBERTY MILLS

Gage No. 6A

This station, established October 23, 1905, is located on the highway bridge across the Hudson river commonly known as Free bridge, about $\frac{3}{4}$ mile south, or downstream from the dam at Northumberland, about $\frac{1}{4}$ mile above the mouth of Batten kill and about $1\frac{1}{4}$ miles above the village of Schuylerville. The gage is a standard chain gage located on the downstream side of the bridge and is read twice daily — at 6:30 A. M. and 5:30 P. M.— to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER AT FREE BRIDGE, LIBERTY MILLS, for the year ended June 30, 1919. Wm. B. Dunstan and Byron H. Bennett, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	84.55	84.4	83.9	86.2	88.15	86.0	87.05	85.6	87.4	90.15	87.5	86.7
2.....	84.6	84.25	84.45	86.0	88.6	86.1	87.6	84.8	85.5	89.5	87.9	87.15
3.....	84.5	84.2	84.9	85.85	88.6	86.0	87.2	85.35	86.25	89.0	87.7	86.8
4.....	84.5	83.9	84.9	85.4	88.3	85.9	87.2	85.5	86.65	88.6	87.9	86.0
5.....	85.1	84.2	84.9	85.3	87.85	85.6	87.0	85.45	86.7	88.5	88.3	85.6
6.....	84.8	84.4	84.9	85.4	87.3	85.55	86.8	85.4	86.8	88.2	88.35	85.55
7.....	84.45	84.1	84.4	85.8	87.3	85.2	86.7	86.4	86.8	88.6	88.75	84.8
8.....	84.6	84.0	84.5	86.1	87.0	84.95	86.45	85.2	86.55	89.15	88.9	84.6
9.....	84.9	84.15	84.3	86.6	86.85	84.9	86.3	84.7	87.4	89.7	88.95	85.15
10.....	84.9	84.2	84.5	86.8	86.0	85.0	86.2	85.15	86.1	89.85	88.4	85.9
11.....	84.45	84.0	84.8	86.4	86.3	85.3	86.0	85.2	87.8	90.5	87.9	85.55
12.....	84.1	84.8	84.8	86.2	86.3	85.4	85.6	85.1	87.65	92.7	87.9	85.35
13.....	84.45	84.8	84.75	86.1	85.9	85.5	85.6	85.1	87.35	94.0	88.15	85.45
14.....	84.4	84.75	84.55	86.05	85.6	85.5	86.1	85.1	87.2	93.35	87.9	85.35
15.....	84.8	84.7	84.5	85.8	85.2	85.5	86.0	85.1	86.85	92.1	87.9	84.8
16.....	85.1	84.65	84.6	85.5	85.2	86.35	85.8	84.8	86.95	90.7	87.9	84.75
17.....	85.3	84.65	84.65	85.25	85.15	86.7	85.6	85.15	87.0	90.45	87.9	85.35
18.....	85.1	84.5	84.75	85.1	85.55	86.5	85.0	85.3	87.25	89.9	88.0	85.9
19.....	85.1	84.3	84.6	85.1	86.9	86.5	84.7	85.2	87.4	89.5	88.5	85.65
20.....	85.2	84.55	84.4	85.1	87.85	86.15	85.5	85.2	87.3	89.45	88.35	85.45
21.....	84.4	84.75	85.25	85.1	88.0	86.0	85.7	85.0	88.2	89.05	88.05	85.1
22.....	84.9	84.5	85.1	85.3	88.0	85.5	85.4	85.1	88.7	88.7	88.8	84.65
23.....	84.3	84.5	84.8	85.6	87.7	86.4	85.45	84.9	88.9	88.0	89.4	84.85
24.....	84.3	84.5	84.8	85.7	87.4	86.8	87.0	85.0	89.05	88.0	90.0	85.25
25.....	83.9	83.9	84.8	85.75	87.0	87.8	86.85	85.0	89.3	87.8	90.4	85.0
26.....	83.95	84.4	85.25	86.0	87.0	88.2	86.5	85.0	89.4	87.6	90.25	85.0
27.....	84.2	84.4	86.95	85.5	86.8	88.6	86.9	85.1	88.9	87.6	90.0	84.75
28.....	84.2	84.4	87.1	85.4	86.5	88.4	86.7	85.2	90.9	87.6	89.9	84.95
29.....	84.8	84.4	86.6	85.65	86.1	87.85	86.3	.....	91.5	87.6	89.5	85.55
30.....	84.8	84.4	86.6	86.0	86.1	87.6	86.15	.....	91.0	87.6	88.35	85.8
31.....	84.6	84.3	.....	87.0	.....	87.45	85.8	.....	90.7	.....	87.5	.....

HUDSON RIVER AT TOLL BRIDGE, SCHUYLERVILLE

Gage No. 112

This station, established August 14, 1905, is located on the bridge across the Hudson river at Ferry street, Schuylerville, commonly known as Toll bridge. The gage is a standard chain gage located on the new truss across the Barge canal channel.

The gage is read twice daily to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER AT TOLL BRIDGE, SCHUYLERVILLE, for the year ended June 30, 1919. Charles Cheney, Observer

DAY	July	DAY	July	DAY	July
1.....	84.55	11.....	84.35	21.....	84.5
2.....	84.65	12.....	84.16	22.....	84.45
3.....	84.46	13.....	84.2	23.....	84.45
4.....	84.3	14.....	84.4	24.....	84.2
5.....	84.46	15.....	84.75	25.....	83.85
6.....	84.4	16.....	85.1	26.....	83.85
7.....	84.3	17.....	84.75	27.....	83.95
8.....	84.25	18.....	84.95	28.....	
9.....	84.4	19.....	84.8	29.....	
10.....	84.5	20.....	84.65	30.....	
				31.....	

NOTE.— Station discontinued July 28, 1918.

HUDSON RIVER BELOW DAM AT STILLWATER

Gage No. 110

This station, established July 15, 1909, is located on the west bank of the Hudson river below the dam at Stillwater. The staff gage at the tail-race of the A. T. Pack grist-mill was replaced on August 17, 1916, by a standard Type A gage in the same location and having a range of 11½ feet, between elevations 74.0 and 85.5 (B. C. datum).

The gage is read twice daily—morning and afternoon—to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW DAM AT STILLWATER, for the year ended June 30, 1919. John T. Morris, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	75.4	75.3	75.1	76.75	78.15	76.8	a	76.8	77.2	78.95	77.4
2	75.8	75.4	75.05	76.5	77.8	76.6	a	76.6	77.2	78.65	77.6
3	75.7	75.4	75.6	76.45	78.0	76.9	a	76.6	76.8	78.4	77.7
4	75.4	75.0	76.0	76.2	78.0	76.5	a	76.4	76.8	78.2	77.8
5	75.7	75.0	75.8	76.35	78.0	76.9	a	76.2	76.8	78.0	78.0
6	75.6	75.2	75.8	76.3	77.8	76.8	a	76.2	76.8	78.0	78.2
7	75.6	75.2	75.6	76.05	77.6	76.3	a	76.0	77.0	78.1	78.25
8	75.25	75.3	75.45	77.1	76.9	76.0	a	76.0	77.0	78.6	78.0
9	75.85	75.4	75.0	77.5	77.1	76.0	76.8	75.8	77.0	78.75	78.15
10	75.6	75.5	75.3	77.2	76.95	76.25	76.8	76.0	78.0	78.8	78.1
11	75.6	75.45	75.65	76.95	76.5	76.0	76.6	76.0	77.9	79.25	77.9
12	75.4	75.0	75.5	76.75	76.7	76.0	76.3	75.8	77.8	80.15	77.75
13	75.5	75.3	75.5	76.5	76.8	76.0	76.1	76.0	77.6	80.7	77.9
14	75.6	75.6	75.5	76.45	76.8	76.45	76.1	75.8	77.1	80.55	77.7
15	76.05	75.6	75.35	76.35	76.0	76.8	76.0	75.9	77.9	79.9	77.65
16	76.2	75.4	75.0	76.15	76.15	76.8	76.0	75.8	76.9	79.5	77.3
17	76.05	75.4	75.45	76.0	75.7	77.0	76.1	76.0	77.25	79.35	77.4
18	76.05	75.3	75.55	76.0	76.7	77.0	76.1	76.0	77.3	79.35	78.85
19	76.0	75.0	75.5	76.0	77.8	76.7	75.9	76.0	77.65	78.95	77.95
20	75.95	75.15	75.45	75.7	78.0	76.8	76.8	76.1	77.85	78.7	78.0
21	75.7	75.3	75.85	75.8	77.9	76.8	75.6	75.8	78.1	78.4	77.8
22	75.65	75.5	76.35	76.0	77.8	76.65	75.65	75.8	78.3	78.3	78.15
23	75.6	75.4	76.4	76.2	77.75	77.25	75.9	75.8	78.4	78.15	78.75
24	75.35	75.4	76.05	76.5	77.5	77.7	76.9	75.8	78.5	77.95	79.0
25	75.15	75.2	75.95	76.5	76.85	78.1	76.8	76.0	78.5	77.9	79.15
26	75.0	75.0	76.1	76.6	76.4	78.55	76.8	76.35	78.35	77.9	79.05
27	75.0	75.15	77.2	76.35	76.95	78.45	77.0	76.1	78.1	77.9	78.8
28	76.0	75.4	77.4	75.9	76.75	78.1	76.8	76.0	78.45	77.65	78.6
29	75.25	75.6	77.1	76.75	76.5	77.7	76.85	.....	79.6	77.55	78.25
30	75.6	75.4	77.0	76.6	77.05	77.65	76.8	.....	79.6	77.5	77.85
31	75.5	75.25	.....	76.8	.....	77.8	76.85	.....	79.4	.....	77.5

a No record.

NOTE.—Station discontinued May 31, 1919.

HUDSON RIVER ABOVE LOCK No. 4, STILLWATER

Gage No. 109

This station, established April 1, 1916, is located at the upper end of Barge canal lock No. 4 at Stillwater. Above the lock a land-line about 2,400 feet long joins the Hudson river about 1,400 feet above the dam. The water-surface indicated approximates that at this junction. The upper concrete staff gage in the lock was used until October 31. Since November 1 a standard Type A gage, No. 109, has been used. This gage is secured to the west upper gate recess and has a range of 12 feet, between elevations 81.0 and 93.0. A standard bench-mark plug is set in the wall near the gage at elevation 92.0 (B. C. datum).

The gage is read twice daily — at 8 A. M. and 3 P. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE LOCK No. 4, STILLWATER, for the year ended June 30, 1919. John O. Fordham, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	84.08	83.80	83.65	84.95	85.95	84.95	85.15	a	a	86.95	85.00	85.25
2.....	84.25	83.80	83.70	84.80	86.18	85.00	85.50	84.60	85.28	86.52	85.70	85.25
3.....	84.15	83.85	84.02	84.72	85.95	84.92	85.45	84.60	85.00	86.30	85.65	85.00
4.....	83.85	83.45	84.35	84.45	85.90	84.80	85.40	84.55	85.00	86.20	85.82	84.85
5.....	83.95	83.12	84.05	84.55	85.62	84.92	85.20	84.60	85.10	86.10	85.95	84.80
6.....	84.00	83.82	84.00	84.55	85.50	84.80	85.00	84.50	85.20	86.00	86.20	84.65
7.....	83.78	83.80	83.95	84.18	85.28	84.65	84.90	84.55	85.25	86.20	86.25	84.45
8.....	83.80	83.85	83.58	85.30	85.18	84.45	85.00	84.50	85.10	86.45	86.02	84.30
9.....	84.00	83.88	83.30	85.50	85.20	84.20	84.98	84.45	85.20	86.68	86.10	84.30
10.....	83.85	83.98	83.90	85.22	84.95	84.88	84.85	84.35	86.00	86.80	86.15	84.75
11.....	83.98	84.00	84.00	85.00	84.80	84.52	84.90	84.50	85.85	87.30	85.85	84.65
12.....	83.80	83.65	83.90	84.90	84.85	84.45	84.80	84.40	85.60	86.00	85.75	84.50
13.....	83.98	84.02	83.95	84.90	85.00	84.35	84.55	84.30	a	88.85	85.95	84.60
14.....	84.15	84.00	83.82	84.70	84.70	84.55	84.65	84.40	a	88.65	85.80	84.50
15.....	84.35	84.00	83.72	84.72	84.38	84.90	84.50	84.45	a	87.95	85.85	84.35
16.....	84.55	83.82	83.30	84.50	84.70	85.15	84.65	84.35	85.20	87.28	85.55	84.18
17.....	84.45	83.90	84.00	84.42	84.72	85.22	84.55	84.45	85.30	87.15	85.60	84.50
18.....	84.35	83.98	83.95	84.35	84.38	85.12	84.60	84.40	a	87.22	85.90	84.70
19.....	84.32	83.65	83.90	84.28	85.70	84.95	84.50	84.45	a	86.90	86.00	84.70
20.....	84.25	84.00	83.88	84.12	85.90	84.98	84.60	84.30	a	86.70	86.00	84.70
21.....	84.10	84.00	84.15	84.18	85.90	84.90	a	84.15	a	86.38	85.85	84.60
22.....	83.88	84.00	84.60	84.50	85.80	84.60	a	84.25	a	86.30	86.02	84.40
23.....	84.00	83.95	84.10	84.60	85.60	85.32	a	84.22	86.40	86.10	86.60	84.10
24.....	83.78	83.95	84.30	84.68	85.42	85.55	a	84.00	86.40	85.98	86.92	84.45
25.....	83.55	83.80	84.30	84.85	85.38	a	a	84.30	86.52	85.90	87.05	84.25
26.....	83.50	83.55	84.40	84.78	85.15	86.30	85.05	84.68	86.40	85.80	87.05	84.20
27.....	83.60	84.00	85.35	84.60	84.95	86.30	a	84.55	86.30	85.80	86.78	84.15
28.....	83.50	83.88	85.50	84.35	84.88	86.05	a	a	87.30	85.65	86.60	84.20
29.....	83.85	83.78	85.15	84.85	84.70	85.72	a	.....	87.65	85.55	86.25	84.40
30.....	84.05	83.72	85.08	84.72	84.95	85.50	a	.....	87.40	85.35	85.85	84.65
31.....	83.90	83.70	.....	85.00	.....	85.85	a	.....	87.30	.....	.....	.....

a No record.

HUDSON RIVER BELOW LOCK No. 4, STILLWATER

Gage No. 108

This station, established October 19, 1916, is located at the lower end of lock No. 4. The water-surface indicated is that of the upper end of the pool maintained by the dam of the West Virginia Pulp and Paper Company. The gage, No. 108, is a standard Type A gage in two sections. The lower section is secured to the nosing at the lower end of the west lock wall and has a range of 11½ feet, between elevations 65.0 and 76.5. The upper section is secured to the end of the west lower thrust wall of the lock and has a range of 8 feet, between elevations 76.5 and 84.5. Standard bench-mark plugs are set in the walls near the gages, for the lower section at elevation 76.0 (B. C. datum) and for the upper section at elevation 79.0 (B. C. datum).

The gage is read twice daily—at 8 A. M. and 3 P. M.—to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOCK No. 4, STILLWATER, for the year ended June 30, 1919. John O. Fordham, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	70.00	69.65	69.95	71.45	72.62	71.85	71.60	a	a	72.20	70.25	70.40
2.....	70.05	68.85	70.65	71.10	72.92	71.60	72.45	71.35	71.95	71.90	70.50	69.70
3.....	69.95	69.90	70.30	71.05	73.00	71.25	72.40	70.25	71.05	71.45	70.50	69.45
4.....	69.25	68.60	70.38	70.45	72.60	71.10	72.20	70.35	70.75	71.60	71.05	69.15
5.....	70.50	69.25	70.05	70.80	72.42	71.18	72.15	70.42	70.70	71.45	71.10	68.85
6.....	70.00	70.50	70.12	71.35	72.15	71.25	71.78	70.00	71.00	71.90	71.40	68.70
7.....	69.50	69.90	70.00	69.90	71.85	70.90	72.00	70.10	71.10	71.70	71.30	67.85
8.....	68.35	69.70	70.38	71.90	71.75	71.25	71.75	70.15	70.75	72.10	71.10	68.70
9.....	70.14	69.25	68.05	72.05	71.45	69.75	71.58	70.45	71.55	72.15	70.95	67.50
10.....	70.18	70.12	69.70	71.65	71.85	71.15	72.15	69.45	72.15	72.20	71.10	70.65
11.....	69.98	70.58	70.10	71.35	71.40	70.75	71.78	70.40	71.85	72.45	71.35	70.25
12.....	69.02	68.60	69.85	71.15	71.45	70.45	71.82	70.00	71.55	73.85	70.65	69.70
13.....	68.70	70.30	70.25	71.60	71.30	70.30	72.05	69.25	a	74.40	71.35	70.00
14.....	70.55	70.32	69.90	70.80	70.95	70.55	71.78	69.95	a	73.90	70.75	69.35
15.....	70.65	70.10	70.08	70.90	70.10	71.85	71.50	70.30	a	72.95	70.75	70.10
16.....	70.75	69.60	68.85	70.48	70.85	72.20	71.50	70.50	71.30	72.38	70.40	67.65
17.....	70.40	69.72	70.30	70.20	71.40	72.05	70.95	69.75	71.05	72.35	70.45	70.35
18.....	70.20	69.75	69.95	70.05	70.50	71.90	71.00	69.75	a	72.42	71.70	70.40
19.....	70.40	67.55	69.98	70.10	72.45	71.40	71.05	69.90	a	72.05	71.25	70.30
20.....	70.25	69.58	69.95	70.00	72.75	71.40	70.85	69.40	a	72.12	71.05	70.35
21.....	70.85	69.50	70.45	69.70	72.70	71.40	a	69.15	a	71.95	70.75	70.10
22.....	69.70	70.00	71.45	70.50	72.50	71.80	a	70.00	a	71.30	71.35	70.35
23.....	69.65	69.90	70.00	70.52	72.20	72.10	a	70.10	72.52	71.00	72.00	68.10
24.....	69.90	70.05	70.45	70.68	72.42	72.45	a	68.75	72.30	70.80	72.05	67.30
25.....	69.45	68.88	70.28	70.75	72.00	a	a	70.00	72.25	70.68	72.45	70.22
26.....	68.80	67.88	70.45	70.75	71.72	73.20	72.10	70.40	72.20	70.45	72.15	70.05
27.....	68.80	68.95	72.65	71.50	71.40	73.10	a	70.30	71.90	70.70	71.75	69.90
28.....	68.10	69.42	72.25	69.75	71.10	72.70	a	a	73.25	70.50	71.70	69.90
29.....	69.80	70.28	72.35	71.05	70.95	72.85	a	.....	73.25	70.20	71.15	70.65
30.....	70.15	69.70	71.75	70.70	71.40	71.95	a	.....	73.30	70.30	70.55	70.55
31.....	69.70	69.95	.....	71.25	.....	71.30	a	.....	72.55	.....	70.35	.....

a No record.

HUDSON RIVER ABOVE DAM No. 3, MECHANICVILLE

Gage No. 106

This station, established October 19, 1916, is located at the upper end of lock No. 3. The water-surface indicated is that above the dam of the West Virginia Pulp and Paper Company. The gage, No. 106, is a standard Type A gage in two sections. The lower section is secured to the nosing at the upper end of the east lock wall and has a range of 11½ feet, between elevations 65.5 and 77.0. The upper section is secured to the face of the old abutment at the upper end of the east lock wall and has a range of 8 feet, between elevations 77.0 and 85.0. Standard bench-mark plugs are set near the gages, for the lower section at elevation 76.0 (B. C. datum) and for the upper section at elevation 80.0 (B. C. datum).

The gage is read twice daily — at 7 A. M. and 3 P. M. — to hundredths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 3, MECHANICVILLE, for the year ended June 30, 1919. Chas. A. Ehren, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	69.80	69.66	70.12	71.50	72.78	71.70	71.65	71.16	71.76	72.22	70.28	70.25
2.....	70.46	68.90	70.78	71.30	73.02	71.80	72.55	a	72.06	a	70.50	69.80
3.....	70.10	69.76	70.46	71.04	73.14	71.41	72.35	a	71.03	71.55	70.61	69.54
4.....	69.48	68.46	70.23	70.40	72.74	71.06	72.22	a	70.78	71.72	71.10	69.10
5.....	70.58	69.36	70.20	70.85	72.46	71.26	72.15	a	a	71.46	71.02	68.84
6.....	70.24	70.52	70.27	71.46	72.21	71.31	71.65	a	a	71.70	71.42	68.74
7.....	69.69	70.06	70.02	70.35	72.10	71.30	71.40	a	a	71.70	71.32	67.86
8.....	69.20	69.75	70.55	71.94	72.18	71.05	71.62	a	a	71.95	71.11	69.25
9.....	69.81	70.11	68.42	72.14	71.60	70.65	71.48	70.30	71.52	72.06	71.15	67.61
10.....	70.70	70.30	69.55	71.85	71.82	71.20	71.40	69.48	72.22	72.18	71.06	70.52
11.....	70.33	70.65	70.28	71.50	72.00	71.10	71.60	70.48	72.01	72.42	71.40	70.61
12.....	69.10	68.82	70.10	71.32	71.76	a	71.45	70.32	71.60	73.82	70.70	69.15
13.....	68.66	70.42	70.35	71.50	71.57	70.60	71.02	69.22	71.54	74.58	71.11	70.26
14.....	70.66	70.34	70.05	70.95	71.25	70.54	70.80	70.22	71.24	73.72	71.10	69.61
15.....	70.70	70.20	70.22	70.96	70.30	71.95	70.36	70.16	70.94	72.90	70.86	70.58
16.....	70.78	69.87	69.00	70.64	70.95	71.76	70.70	70.50	71.46	72.40	70.38	68.25
17.....	70.48	69.86	70.16	70.38	71.48	72.32	69.85	70.30	71.16	72.22	70.44	70.46
18.....	70.22	69.72	70.16	70.26	70.75	72.12	70.65	69.96	71.30	72.26	71.70	70.50
19.....	69.96	68.00	70.21	70.35	72.49	71.80	70.86	70.00	71.85	72.04	71.22	70.40
20.....	70.36	69.78	70.10	70.23	72.69	71.46	70.58	69.85	71.77	72.12	71.12	70.52
21.....	70.72	69.72	70.45	69.78	72.67	71.46	70.91	69.80	72.18	71.48	70.64	69.96
22.....	69.78	70.36	71.35	70.32	72.58	72.00	70.46	70.00	72.45	71.26	71.46	70.22
23.....	69.86	70.05	70.32	70.52	72.56	72.20	70.46	70.20	72.60	71.20	71.95	67.90
24.....	70.00	70.16	70.49	70.65	72.65	72.66	71.80	69.08	72.20	70.80	72.10	67.10
25.....	69.76	69.30	70.38	70.88	72.15	a	71.78	a	72.36	70.92	72.61	70.30
26.....	69.02	68.60	70.68	70.88	71.81	73.22	72.11	70.53	72.16	70.46	71.19	70.09
27.....	68.88	69.26	72.81	71.40	71.50	73.16	71.80	70.22	72.04	71.00	71.82	69.68
28.....	68.25	70.24	72.48	69.86	71.16	72.90	71.56	70.00	73.24	70.50	71.70	70.15
29.....	69.80	70.36	72.25	71.15	70.66	72.90	71.36	.....	73.26	70.26	71.16	70.96
30.....	69.94	69.86	71.72	70.88	71.66	72.42	71.26	.....	73.20	70.64	70.55	70.78
31.....	70.11	70.14	.....	71.44	.....	71.46	71.06	.....	72.82	.....	70.35	.....

a No record.

HUDSON RIVER BELOW DAM No. 3, MECHANICVILLE

Gage No. 105

This station, established October 19, 1916, is located at the lower end of lock No. 3. The water-surface indicated is that below the dam of the West Virginia Pulp and Paper Company and at the upper end of the pool above the dam of the Adirondack Electric Power Corporation. The gage, No. 105, is a standard Type A gage in two sections. The lower section is secured to the nosing at the lower end of the east wall of the lock and has a range of $10\frac{1}{2}$ feet, between elevations 46.0 and 56.5. The upper section is secured to the lower end of the east thrust wall of the lock and has a range of 12 feet, between elevations 56.5 and 68.5. Standard bench-mark plugs are set in the walls near the gages, for the lower section at elevation 52.0 (B. C. datum) and for the upper section at elevation 59.0 (B. C. datum).

The gage is read twice daily—at 7 A. M. and 3 P. M.—to hundredths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW DAM No. 3, MECHANICVILLE, for the year ended June 30, 1919. Chas. A. Ehren, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	48.62	47.98	47.95	49.42	50.32	49.18	49.90	49.32	50.20	52.26	50.24	50.06
2.....	48.36	47.98	47.92	49.26	50.62	49.32	50.85	a	50.58	a	50.55	50.02
3.....	48.25	47.98	48.20	49.08	50.34	49.15	50.70	a	50.02	51.33	50.71	49.54
4.....	47.95	47.90	48.09	48.55	50.18	48.67	50.58	a	49.64	51.36	50.80	49.15
5.....	48.10	48.02	48.12	48.68	49.78	49.00	50.00	a	a	51.24	51.02	49.00
6.....	48.02	47.98	48.08	48.58	49.72	48.98	49.99	a	a	51.10	51.70	48.85
7.....	47.87	48.14	48.10	48.16	49.38	48.86	49.40	a	a	51.45	51.65	48.32
8.....	48.39	47.80	48.02	49.80	48.85	48.30	49.72	a	a	51.76	51.42	48.00
9.....	48.20	48.10	47.94	50.16	48.96	48.05	49.62	48.25	50.05	52.04	51.25	47.88
10.....	48.35	48.11	48.05	49.80	48.86	48.70	49.36	49.06	51.06	52.26	51.38	48.78
11.....	48.10	48.05	48.05	49.30	48.50	49.35	49.45	49.11	50.80	52.46	51.30	48.54
12.....	48.16	48.01	48.08	49.10	48.91	a	48.50	48.58	50.50	54.52	51.02	48.44
13.....	47.95	47.98	48.06	48.82	49.21	48.50	49.04	48.34	50.41	55.14	51.34	48.40
14.....	48.09	48.00	48.00	48.44	48.82	48.50	49.08	48.30	50.17	54.62	51.35	48.25
15.....	48.21	47.95	48.05	48.63	48.26	48.95	49.78	48.40	50.02	53.55	51.03	48.03
16.....	48.48	48.04	47.90	48.40	48.54	50.00	49.08	48.50	49.88	52.70	50.48	48.14
17.....	48.35	47.95	48.10	48.34	48.35	50.09	48.65	48.50	50.15	52.56	50.50	48.26
18.....	48.28	47.97	47.94	48.32	48.36	49.92	48.86	48.44	50.44	52.56	51.32	48.46
19.....	48.02	48.27	48.06	48.32	50.50	49.74	48.51	48.40	51.12	52.26	51.54	48.50
20.....	48.25	48.02	48.04	48.20	50.82	49.26	48.71	48.20	51.04	52.26	51.50	48.64
21.....	47.96	48.03	48.16	48.30	50.80	49.26	48.75	48.06	51.51	51.32	51.06	48.42
22.....	47.98	48.06	48.65	48.34	50.43	49.60	48.52	48.35	51.70	51.00	51.66	48.25
23.....	48.09	48.06	48.10	48.40	50.10	50.02	48.02	47.93	51.40	50.81	52.35	48.14
24.....	48.02	48.12	48.22	48.50	49.41	50.60	49.85	48.01	51.62	50.68	52.50	48.08
25.....	48.06	48.04	48.09	48.96	49.43	a	50.20	a	51.70	50.94	52.70	48.20
26.....	48.04	47.94	48.32	48.78	49.28	50.76	49.85	48.76	51.50	50.50	52.52	48.01
27.....	48.06	47.94	51.09	48.18	49.42	51.66	49.86	48.96	51.17	50.76	52.00	47.96
28.....	48.00	48.00	50.48	48.20	49.25	51.41	49.66	48.48	53.10	50.52	51.91	48.12
29.....	48.10	48.08	49.85	49.00	49.02	50.90	49.50	.....	53.66	50.22	51.26	48.10
30.....	48.05	47.94	49.76	48.72	49.42	50.40	49.44	.....	53.15	50.60	50.64	48.20
31.....	48.02	47.90	.....	48.78	.....	50.36	49.11	.....	52.88	.....	51.26	.....

a No record.

HUDSON RIVER AT MECHANICVILLE

Location.—At Duncan dam of West Virginia Pulp & Paper Co., in Mechanicville, Saratoga county, 3,700 feet above mouth of Anthony kill, $1\frac{1}{4}$ miles below mouth of Hoosic river and about 19 miles above mouth of Mohawk river.

Drainage area.—4,500 square miles.

Records available.—1888 to June 30, 1919.

Gage.—Water-stage recorder at the dam installed in 1910; previous to that date, staff gage.

Computations of discharge.—Discharge over spillway determined from a rating curve based on coefficients derived by United States Geological Survey for dams of ogee section. Discharge through turbines computed from records of their operation. Discharge at lock and through Barge canal turbines at lock computed from records of the number of lockages per day.

Extremes of discharge.—Current year: Maximum daily discharge, 31,600 second-feet, April 13. Minimum daily discharge, 587 second-feet, August 4.

1888–1919: Maximum discharge recorded, 120,000 second-feet at 6 A. M., March 28, 1913.* The plant is occasionally shut down and the flow of the river stored in the pond, so that the discharge below the station occasionally becomes practically zero.

Diversions.—Water is diverted from Hudson river through the Glens Falls feeder and the old Champlain canal into the summit level of the Barge canal. A portion flows north into Lake Champlain. No correction has been made for this diversion.

Coöperation.—Record of discharge over the spillway and through turbines of the West Virginia Pulp & Paper Co. furnished by W. J. Barnes, engineer of the company.

* Highest known flood prior to this time occurred April, 1869. Calculated discharge, 70,000 second-feet. See Water-Supply Paper 65, page 51, and report of United States Board of Engineers on Deep Waterways, part I, pages 377–388.

Daily discharge, in second-feet, of HUDSON RIVER AT WEST VIRGINIA PULP AND PAPER Co.'s MILL (UPPER DAM), MECHANICVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2,330	1,640	631	6,410	14,400	6,830	8,690	5,000	10,400	14,700	9,340	6,900
2.....	2,650	1,350	1,050	5,660	14,800	6,800	13,400	3,580	7,190	12,500	9,990	8,480
3.....	2,460	1,740	2,600	4,460	13,300	5,440	11,400	4,770	6,490	11,400	10,100	7,180
4.....	1,460	587	2,520	4,920	13,100	5,340	10,400	4,450	5,820	11,500	10,300	6,090
5.....	3,020	1,220	2,140	4,000	11,600	6,070	7,760	4,210	8,270	11,000	14,400	5,390
6.....	2,290	1,670	2,170	3,260	10,300	5,280	6,960	3,670	7,660	10,600	13,400	4,990
7.....	1,430	1,650	1,790	4,780	8,460	4,660	6,600	3,980	7,240	12,700	14,400	4,000
8.....	1,990	1,520	1,190	9,190	7,660	4,190	6,680	3,710	6,490	14,100	11,700	3,070
9.....	2,990	1,410	1,120	8,900	6,890	3,390	6,520	2,280	8,800	14,700	13,700	4,020
10.....	2,580	1,420	1,740	7,460	6,280	4,890	6,220	3,150	12,400	14,900	11,800	5,200
11.....	2,090	1,160	2,140	6,480	5,870	4,340	5,340	3,760	10,400	17,300	11,800	4,620
12.....	1,820	1,200	1,890	5,490	6,380	4,080	4,140	3,300	9,010	27,300	11,300	4,170
13.....	2,250	2,040	2,040	4,940	6,190	4,270	4,880	2,890	7,760	31,600	12,200	3,930
14.....	1,710	2,010	1,580	4,920	4,380	4,610	4,960	3,040	6,460	29,400	10,800	3,320
15.....	3,930	1,940	1,030	4,970	3,770	8,420	4,560	3,460	6,860	23,900	11,000	2,340
16.....	4,140	1,710	1,360	4,200	4,620	11,400	4,680	2,160	5,980	20,300	9,840	2,920
17.....	3,640	1,680	2,180	3,780	3,520	9,750	4,380	3,280	7,250	20,400	10,700	3,760
18.....	3,790	988	2,090	3,480	8,320	7,950	4,730	3,540	9,040	20,200	13,800	4,940
19.....	3,400	1,190	1,780	3,100	12,200	7,170	3,730	3,380	10,700	17,300	13,800	4,500
20.....	3,120	1,670	1,780	1,520	13,400	6,740	4,960	2,790	10,900	15,900	12,500	4,200
21.....	1,830	1,670	3,360	3,360	13,100	6,250	4,340	2,510	13,000	13,900	11,600	3,870
22.....	2,240	1,650	3,290	4,240	12,200	7,240	4,010	2,800	14,300	13,400	16,600	2,260
23.....	2,160	1,630	2,700	4,730	10,800	11,900	4,790	1,840	13,000	11,300	18,600	2,980
24.....	1,770	1,600	3,120	5,090	9,880	13,100	8,510	2,590	13,500	11,100	19,300	2,520
25.....	1,350	788	2,690	4,760	9,570	17,400	7,790	3,300	13,700	10,600	19,600	2,430
26.....	1,260	1,040	5,230	5,090	7,800	16,700	7,790	4,690	12,400	10,100	19,000	2,320
27.....	1,230	1,300	12,100	4,960	6,910	15,700	8,010	4,010	12,300	11,100	17,200	2,400
28.....	810	1,470	9,740	4,280	4,880	13,500	7,000	3,920	20,000	9,660	15,600	2,260
29.....	1,720	1,520	8,970	5,030	6,660	11,400	6,510	.....	21,500	9,150	13,500	2,800
30.....	2,170	1,630	7,800	4,790	6,720	9,600	6,140	.....	18,500	9,500	10,300	4,440
31.....	1,920	1,460	.....	5,010	.....	8,620	5,900	.....	16,500	.....	9,550	.....
Mean...	2,310	1,470	3,130	4,940	8,800	8,160	6,510	3,430	11,000	15,400	13,200	4,080

Monthly discharge of HUDSON RIVER AT WEST VIRGINIA PULP AND PAPER Co.'s MILL (UPPER DAM), MECHANICVILLE, for the year ended June 30, 1919
[Drainage area, 4,500 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	4,140	810	2,310	0.513	0.59
August.....	2,040	587	1,470	0.327	0.38
September.....	12,100	631	3,130	0.696	0.78
October.....	9,190	1,520	4,940	1.10	1.27
November.....	14,800	3,520	8,800	1.96	2.19
December.....	17,400	3,390	8,160	1.81	2.09
January.....	13,400	3,730	6,510	1.45	1.67
February.....	6,000	1,840	3,430	0.762	0.79
March.....	26,000	5,820	11,000	2.44	2.81
April.....	31,600	9,150	15,400	3.42	3.82
May.....	19,600	9,340	13,200	2.93	3.38
June.....	8,480	2,260	4,080	0.907	1.01
The year.....	31,600	587	6,869	1.53	20.78

HUDSON RIVER AT TOLL BRIDGE, MECHANICVILLE

Gage No. 9

This station, established August 16, 1905, is located at the highway bridge crossing the Hudson river at Mechanicville, commonly known as Toll bridge, about 2 miles above the lower dam and about $\frac{3}{4}$ mile below the upper dam. The gage is a standard chain gage located on the upstream side of the first span from the west end of the bridge. Readings are taken twice daily — at 8 A. M. and 5:30 P. M.— to half-tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER AT TOLL BRIDGE, MECHANICVILLE, for the year ended June 30, 1919. Byron Stedman, Observer

DAY	July	Aug.	DAY	July	Aug.	DAY	July	Aug.
1.....	48.32	48.20	11.....	48.20	48.28	21.....	48.10	.....
2.....	48.35	48.15	12.....	48.15	48.15	22.....	48.10	.....
3.....	48.18	48.10	13.....	48.30	48.30	23.....	48.32	.....
4.....	48.18	47.85	14.....	48.05	48.22	24.....	48.30	.....
5.....	48.55	48.10	15.....	48.42	48.10	25.....	48.20	.....
6.....	48.35	48.20	16.....	48.60	.....	26.....	48.15	.....
7.....	47.90	48.10	17.....	48.48	.....	27.....	48.10	.....
8.....	48.20	48.25	18.....	48.40	.....	28.....	48.20	.....
9.....	48.15	48.15	19.....	48.30	.....	29.....	48.20	.....
10.....	48.40	48.15	20.....	48.30	.....	30.....	48.20	.....
						31.....	48.25	.....

NOTE.— Station discontinued August 15, 1918.

HUDSON RIVER ABOVE DAM No. 2, MECHANICVILLE

Gage No. 104

This station, established October 19, 1916, is located at the upper end of lock No. 2, and is practically a continuation of the station, "Hudson River above Dam of Adirondack Electric Power Corporation." The gage, No. 104, is a standard Type A gage secured to the splay wall at the upper end of the lock and has a range of 12 feet, between elevation 44.0 and 56.0. A standard bench-mark plug is set in the wall near the gage at elevation 52.0 (B. C. datum).

The gage is read twice daily — 8 A. M. and 3 P. M.— to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 2, MECHANICVILLE, for the year ended June 30, 1919. Wm. H. Gaillard, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	47.95	47.85	47.8	48.95	49.55	48.45	49.15	48.75	49.3	50.9	49.75	49.6
2.....	47.95	47.85	47.78	48.68	49.6	48.85	a	48.95	a	a	49.85	49.3
3.....	47.8	47.85	47.9	48.45	49.2	48.55	a	48.35	a	50.2	49.95	49.1
4.....	47.8	47.6	47.95	47.95	49.2	48.3	a	48.05	a	50.15	50.3	48.75
5.....	47.8	47.8	47.85	48.2	48.85	48.5	49.5	48.15	a	50.05	50.4	48.6
6.....	47.8	47.65	47.85	48.05	49.0	49.5	a	48.05	a	50.1	50.65	48.3
7.....	47.7	47.9	47.85	47.9	48.4	49.4	a	48.15	a	50.3	50.6	49.0
8.....	47.75	47.9	47.95	49.2	48.4	47.7	a	48.10	a	50.55	50.55	47.65
9.....	47.8	47.85	47.82	49.5	48.3	47.7	a	47.85	a	50.75	50.35	48.0
10.....	47.95	47.95	47.88	49.2	48.05	48.6	a	a	a	50.8	50.6	48.4
11.....	47.95	48.0	47.95	48.9	48.2	47.9	a	a	a	50.95	50.55	48.2
12.....	47.7	47.85	47.90	48.55	48.55	a	a	a	a	52.35	50.2	48.05
13.....	47.8	47.95	47.90	48.05	48.6	47.8	a	a	a	52.95	50.45	47.9
14.....	48.0	47.8	47.85	48.0	48.25	47.95	a	a	a	52.65	50.2	47.9
15.....	48.0	47.8	47.85	48.0	47.8	49.5	a	a	a	51.9	50.15	47.8
16.....	48.2	47.85	47.68	47.9	48.05	49.55	a	47.65	a	51.25	49.95	47.9
17.....	47.85	47.9	47.95	47.95	47.9	49.2	a	a	49.5	51.15	49.75	47.95
18.....	47.85	47.75	47.85	47.9	47.85	49.25	a	a	49.65	51.2	50.7	49.1
19.....	47.9	47.9	47.88	47.95	49.85	48.8	48.2	a	50.3	50.95	50.7	48.0
20.....	47.95	47.9	47.9	47.9	49.95	48.75	48.4	a	50.2	50.75	50.55	48.25
21.....	47.8	47.85	47.95	47.9	49.95	48.7	48.3	a	50.6	50.25	50.15	47.95
22.....	47.85	47.75	48.15	47.95	49.35	48.2	a	a	50.7	50.1	50.6	48.15
23.....	47.85	47.85	47.92	48.0	48.85	49.4	a	47.75	50.5	49.8	51.05	47.9
24.....	47.85	47.8	47.95	48.1	48.45	49.85	a	47.9	50.5	50.0	51.1	47.9
25.....	47.85	47.8	47.80	48.35	48.6	50.8	a	47.95	50.7	50.1	51.4	47.75
26.....	47.9	47.75	48.05	48.3	48.4	50.75	49.4	48.30	a	49.75	51.35	47.75
27.....	47.8	47.8	50.15	47.8	48.9	50.7	a	49.0	a	50.1	50.75	47.8
28.....	47.8	47.95	49.5	47.85	48.55	50.4	a	48.15	a	48.85	50.6	47.8
29.....	47.8	47.9	49.15	48.5	48.3	50.15	48.9	.....	a	49.7	50.15	47.95
30.....	47.85	47.85	49.2	48.15	48.85	48.85	48.8	.....	51.6	50.0	49.85	48.35
31.....	47.95	47.75	.....	48.6	.....	49.5	48.65	.....	51.3	.....	49.75	.....

a No record.

HUDSON RIVER BELOW DAM No. 2, MECHANICVILLE

Gage No. 103

This station, established September 1, 1917, is located at the lower end of lock No. 2, and is practically a continuation of the station, "Hudson River below Dam of Adirondack Electric Power Corporation." The gage, No. 103, is a chain gage secured to the downstream side of the bridge across the lower end of lock No. 2. This gage gives elevations direct and has a range of 23 feet, between elevations 21.5 and 44.5.

The gage is read twice daily—8 A. M. and 3 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOWER DAM, No. 2, MECHANICVILLE, for the year ended June 30, 1919. Wm. H. Gaillard, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	30.5	30.15	30.05	31.9	32.8	31.4	27.95	26.95	27.9	32.25	32.35	32.2
2.....	30.8	30.25	30.0	31.7	32.2	31.65	a	25.65	a	a	32.7	32.15
3.....	30.3	30.15	30.35	31.45	30.7	31.5	a	26.45	a	31.15	32.9	32.0
4.....	30.2	30.15	30.4	31.1	31.15	31.25	a	26.05	a	31.15	32.75	31.65
5.....	30.6	30.1	30.3	31.3	30.65	31.5	27.8	25.65	a	30.85	33.15	31.5
6.....	30.5	30.0	30.4	31.25	32.55	31.5	a	25.35	a	31.1	33.75	31.3
7.....	30.25	30.4	30.35	30.8	30.6	31.4	a	25.25	a	31.25	33.6	31.1
8.....	30.5	30.1	30.2	31.9	30.6	30.7	a	25.6	a	31.9	33.45	30.85
9.....	30.6	30.25	30.2	32.6	30.5	30.6	a	24.2	a	32.05	33.25	30.95
10.....	30.65	30.2	30.1	32.15	30.9	31.4	a	a	a	32.45	33.5	31.45
11.....	30.55	30.15	30.3	31.75	31.4	29.9	a	a	a	32.65	33.05	31.25
12.....	30.45	30.1	30.4	31.5	31.6	a	a	a	a	35.05	32.9	31.15
13.....	30.35	30.2	30.4	31.55	31.6	24.95	a	a	a	35.25	33.35	31.0
14.....	30.5	30.3	30.15	31.25	31.35	25.65	a	a	a	35.1	33.1	30.8
15.....	30.85	30.25	30.15	31.15	30.75	26.75	a	a	a	33.9	33.0	30.75
16.....	31.2	30.3	30.1	31.1	31.2	28.85	a	23.95	a	32.75	32.9	30.8
17.....	31.0	30.15	30.4	31.15	31.1	28.6	a	a	28.55	32.85	32.75	30.65
18.....	30.7	30.15	30.35	30.85	30.95	28.05	a	a	29.00	33.25	33.55	31.1
19.....	30.65	30.15	30.35	30.65	32.95	27.5	25.6	a	30.65	33.2	33.6	31.2
20.....	30.8	30.1	30.15	30.6	33.05	27.05	26.5	a	30.2	32.3	33.6	31.15
21.....	30.65	30.3	30.5	30.6	33.0	27.0	26.2	a	31.45	32.0	33.2	30.9
22.....	30.45	30.3	31.05	30.9	32.1	26.5	a	a	31.8	31.4	33.7	30.6
23.....	30.6	30.2	30.5	31.1	31.0	28.5	a	23.65	32.0	31.35	34.45	30.5
24.....	30.3	30.2	30.5	31.1	30.9	29.8	a	24.1	32.05	31.85	34.7	30.55
25.....	30.3	30.15	30.6	31.3	30.75	30.95	a	24.65	32.15	31.9	34.75	30.5
26.....	30.2	30.05	30.95	31.35	30.55	31.15	25.8	25.95	a	31.5	34.8	30.5
27.....	30.2	29.95	33.1	31.05	31.8	31.25	a	25.8	a	31.5	34.5	30.5
28.....	30.1	30.05	32.9	31.0	31.55	30.5	a	25.25	a	31.8	34.35	30.45
29.....	30.1	30.1	32.15	31.5	31.25	29.6	27.3	.....	a	32.45	33.65	30.5
30.....	30.4	30.1	32.00	31.25	31.75	29.1	27.0	.....	33.25	32.7	33.0	31.05
31.....	30.45	30.05	.....	31.6	.....	28.2	26.8	.....	33.00	.....	32.85	.....

a No record.

HUDSON RIVER AT DAM OF ADIRONDACK ELECTRIC POWER CORPORATION (LOWER DAM), MECHANICVILLE

Location.— At the dam of the Adirondack Electric Power Corporation across the Hudson river, which is also known as dam No. 2, or lower Mechanicville dam. It is about $2\frac{1}{2}$ miles below the West Virginia Pulp and Paper Company's dam, which is also known as dam No. 3, or upper Mechanicville dam.

Drainage area.— 4,570 square miles.

Records available.— Water-surface elevations, August 18, 1905, to June 30, 1919. Discharge, October 1, 1897, to June 30, 1919. Water-surface elevations given by gage above dam No. 2, Mechanicville.

Gages.— The gage above the dam is a vertical staff attached to a crib upstream from the power-house. Lower gage is a reference point on the hand-rail of downstream truss of highway bridge to Barge canal lock about 150 yards below power-house. This gage indicates elevation in tail-race.

Discharge computations.— Discharge is determined by the flow over the crest of the dam and the water passed through the wheels of the power company.

Extremes of discharge.— Current year: Maximum daily mean recorded, April 13, as 38,000 second-feet. Minimum daily mean recorded, August 26 and September 1, as 1,300 second-feet.

1897-1919: Maximum water-surface above dam recorded, elevation 58.5 on March 28, 1913, at 8 A. M.; discharge estimated by Department of State Engineer as about 94,000 second-feet. Minimum daily mean recorded, on August 29, 1909, as 24 second-feet.

Coöperation.— Records of flow over the dam and through the wheels are computed and furnished by the Adirondack Electric Power Corporation through Mr. George E. Fifield, Local Superintendent, to which are added estimated amounts of water used for canal purposes.

GAGING OF STREAMS: HUDSON RIVER BASIN 255

Daily discharge, in second-feet, of HUDSON RIVER AT DAM OF ADIRONDACK ELECTRIC POWER CORPORATION (LOWER DAM), MECHANICVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3,030	2,390	1,300	7,480	13,500	6,590	9,330	5,450	10,400	23,300	10,400	8,740
2.....	3,580	2,380	1,360	6,520	15,800	7,180	13,200	4,530	12,900	20,300	11,300	9,090
3.....	3,240	1,930	2,730	6,490	14,200	6,950	12,900	5,640	10,500	19,000	12,000	8,330
4.....	2,010	1,370	3,430	5,460	14,300	5,990	11,200	5,760	8,940	18,900	11,600	6,890
5.....	3,810	1,690	2,630	5,550	13,000	6,420	9,230	5,030	8,940	18,100	14,700	6,270
6.....	3,160	2,160	2,780	5,150	12,200	6,070	9,100	5,000	9,960	18,100	16,700	5,380
7.....	2,400	2,160	2,390	4,190	9,470	5,420	7,890	4,810	9,930	19,700	16,100	5,140
8.....	2,680	1,900	1,740	8,390	8,240	4,120	8,000	4,770	9,310	21,900	14,500	3,820
9.....	3,080	2,180	1,520	9,960	8,130	3,380	7,700	3,210	9,350	22,700	14,200	4,190
10.....	3,680	2,010	1,840	8,460	6,890	5,430	7,190	3,130	16,600	23,300	14,900	5,920
11.....	2,930	1,760	2,460	6,980	5,840	5,160	6,840	4,800	15,300	24,400	12,800	5,890
12.....	2,800	1,530	2,310	6,260	6,380	4,610	5,200	4,350	13,700	34,700	16,100	5,150
13.....	2,540	2,310	2,510	5,560	6,880	4,570	6,190	3,940	12,600	38,000	14,800	4,930
14.....	2,680	2,720	1,710	5,640	5,900	5,220	6,490	4,090	10,800	36,900	13,400	3,920
15.....	3,880	2,680	1,700	5,720	4,040	7,030	5,320	4,280	9,430	31,600	12,900	4,070
16.....	5,280	2,160	1,550	5,130	4,980	10,800	5,920	2,860	8,480	26,100	11,600	3,660
17.....	4,640	1,980	2,580	4,350	4,640	10,200	5,620	4,040	9,990	25,500	11,800	4,480
18.....	4,330	1,570	2,600	3,910	5,520	9,360	5,930	4,060	10,900	25,600	15,800	5,410
19.....	4,400	1,310	2,220	3,560	12,100	7,890	4,060	4,260	13,800	22,800	15,700	5,500
20.....	3,700	1,830	1,990	2,440	13,400	7,430	5,620	3,960	13,800	20,700	14,900	5,640
21.....	2,720	2,210	2,990	3,440	13,900	6,800	6,000	3,650	16,000	19,100	13,600	4,950
22.....	2,630	1,800	4,740	4,700	13,900	6,210	5,170	3,690	17,400	17,800	16,700	3,410
23.....	3,070	1,770	3,170	5,240	13,500	10,000	5,660	3,050	18,200	16,500	21,400	3,720
24.....	2,260	1,830	3,740	5,520	10,600	12,500	8,900	3,040	19,300	13,500	23,400	3,600
25.....	1,970	1,870	3,650	5,750	10,900	16,800	9,520	4,180	18,800	13,000	23,400	3,780
26.....	1,630	1,300	4,280	5,820	9,400	17,000	8,960	5,560	18,100	12,100	24,500	3,410
27.....	1,720	1,810	12,800	5,370	7,870	16,600	9,520	5,640	16,800	12,100	21,400	3,310
28.....	1,490	1,950	11,400	4,860	6,500	14,200	8,650	5,040	28,500	12,100	20,100	3,000
29.....	2,175	1,950	9,160	5,550	6,210	11,700	8,130	.....	29,800	10,400	16,400	3,630
30.....	2,970	1,940	8,590	5,480	7,780	9,120	7,800	.....	26,600	10,900	12,200	5,630
31.....	2,700	1,810	.....	6,600	.....	7,990	7,360	.....	26,600	.....	10,700	.....
Mean...	2,994	1,944	3,595	5,662	9,532	8,346	7,697	4,351	14,891	20,970	15,374	5,032

Monthly discharge, in second-feet, of HUDSON RIVER AT DAM OF ADIRONDACK ELECTRIC POWER CORPORATION (LOWER DAM), MECHANICVILLE, for the year ended June 30, 1919

[Drainage area, 4,570 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	5,280	1,490	2,994	0.655	0.76
August.....	2,720	1,300	1,944	0.425	0.49
September.....	12,800	1,300	3,595	0.787	0.88
October.....	9,960	2,440	5,662	1.239	1.43
November.....	15,800	4,040	9,532	2.086	2.33
December.....	17,000	3,380	8,346	1.826	2.11
January.....	13,200	4,060	7,697	1.684	1.94
February.....	5,760	2,860	4,351	0.952	0.99
March.....	29,800	8,480	14,891	3.258	3.76
April.....	38,000	10,400	20,970	4.589	5.12
May.....	24,500	10,400	15,374	3.364	3.88
June.....	9,090	3,000	5,032	1.101	1.23
The year.....	38,000	1,300	8,366	1.830	24.92

HUDSON RIVER ABOVE DAM No. 1, NEAR WATERFORD

Gage No. 102

This station, established October 19, 1916, is located at the upper end of lock No. 1. The gage, No. 102, is a standard Type A gage secured to the upper end of the east upper gate recess and has a range of 20 feet, between elevations 19.0 and 39.0. A standard bench-mark plug is set in the wall near the gage at elevation 38.0 (B. C. datum).

The gage is read twice daily — at 7 A. M. and 3 P. M.— to half-tenths and even hundredths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 1, NEAR WATERFORD, for the year ended June 30, 1919. H. W. Steventon, Observer.

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	30.64	30.40	30.36	31.81	32.51	31.51	20.80	20.04	a	26.88	32.28	32.16
2	30.85	30.42	30.14	31.59	31.14	31.61	21.78	19.77	23.84	25.58	32.36	32.05
3	30.68	30.88	30.52	31.52	29.36	31.84	22.03	19.99	a	25.00	32.60	31.90
4	30.38	30.15	30.74	31.25	29.98	31.28	21.60	19.60	a	24.97	32.58	31.70
5	30.61	30.28	30.52	31.31	29.32	31.44	20.51	19.68	a	24.75	32.79	31.54
6	30.56	30.32	30.66	31.29	32.28	31.43	20.35	19.36	a	24.69	33.26	31.36
7	30.40	30.48	30.54	31.04	29.48	31.31	20.30	19.24	a	25.24	33.00	31.22
8	30.55	30.29	30.35	31.88	29.82	31.11	20.35	19.29	a	27.98	32.96	31.05
9	30.70	30.42	30.25	32.22	30.24	31.02	20.25	18.75	20.62	28.30	32.87	30.94
10	30.60	30.38	30.22	32.02	30.82	31.26	20.88	a	a	28.78	33.03	31.41
11	30.65	30.40	30.54	31.70	30.96	25.75	20.80	a	a	29.10	32.71	31.36
12	30.55	30.30	30.55	31.56	31.54	19.21	20.45	a	20.83	31.20	32.66	31.15
13	30.40	30.46	30.53	31.37	31.69	19.21	20.39	a	21.66	31.18	32.90	31.12
14	30.68	30.49	30.44	31.36	31.42	19.36	20.01	a	21.42	30.84	32.72	31.06
15	30.92	30.58	30.31	31.32	30.98	20.08	19.94	a	20.69	29.40	32.67	30.86
16	31.25	30.46	30.33	31.23	31.22	21.48	19.74	18.76	20.50	27.64	32.42	30.83
17	31.12	30.45	30.57	31.11	31.22	21.05	19.51	a	21.67	28.50	32.39	31.02
18	30.98	30.35	30.50	31.06	31.11	20.77	19.64	a	25.10	30.63	33.10	31.28
19	31.02	30.28	30.48	30.90	32.56	20.45	19.62	a	28.38	31.10	33.05	31.22
20	30.85	30.30	30.34	30.51	32.69	20.12	19.78	a	28.12	30.28	33.02	31.19
21	30.70	30.42	30.72	30.77	32.67	20.02	19.64	a	29.30	30.05	32.76	31.10
22	30.48	30.50	31.20	31.16	32.61	19.92	19.25	a	30.06	29.46	33.02	30.88
23	30.62	30.48	30.76	31.21	30.05	20.93	19.40	18.66	30.16	30.18	33.66	30.80
24	30.38	30.40	30.89	31.23	30.46	21.88	20.95	a	30.34	30.98	33.85	30.80
25	30.40	30.28	30.86	31.36	30.08	22.44	20.98	a	30.30	31.06	33.88	30.79
26	30.25	30.10	30.98	31.30	30.05	23.48	20.14	a	29.96	30.78	33.98	30.69
27	30.30	30.30	32.78	31.26	31.69	22.71	20.76	a	29.40	30.86	33.62	30.62
28	30.34	30.38	32.43	31.12	31.54	22.61	20.50	a	31.32	31.64	33.50	30.62
29	30.22	30.40	32.05	31.46	31.26	21.96	20.22	.....	29.58	32.31	33.06	31.08
30	30.56	30.89	32.01	31.27	31.71	21.26	20.24	.....	28.44	32.45	32.66	31.32
31	30.60	30.44	.....	31.54	.....	20.54	20.11	.....	27.90	.....	32.46	.....

a No record.

NOTE.— A record of Taintor gate openings is shown in the table on the following page.

GAGING OF STREAMS: HUDSON RIVER BASIN 257

Gate openings of the six Taintor gates in DAM No. 1, NEAR WATERFORD, for the year ended June 30, 1919

FROM		To		Number of gates open	Time open
Day	Hour	Day	Hour		
July 1	.....	Oct. 19	.....	0	.....
Oct. 20	.....	Oct. 26	.....	6	(Lowered)
Oct. 27	.....	Nov. 2	9 A. M.	0	.....
Nov. 2	9 A. M.	Nov. 5	7 P. M.	2	.....
Nov. 5	7 P. M.	Nov. 6	6 P. M.	1	.....
Nov. 6	6 P. M.	Nov. 10	10 A. M.	1	.....
Nov. 10	10 A. M.	Nov. 21	4:30 P. M.	0	.....
Nov. 21	4:30 P. M.	Nov. 25	12 P. M.	1	.....
Nov. 22*	.....	.....	.....	1	8 hours
Nov. 28*	.....	.....	.....	1	12 1/2 hours
Nov. 25*	.....	.....	.....	1	13 1/2 hours
Nov. 26	.....	.....	.....	2	9 1/2 hours
Nov. 27	.....	Dec. 10	.....	0	.....
Dec. 11	.....	.....	.....	5	.....
Dec. 12	.....	Mar. 16	.....	6	.....
Mar. 17	.....	.....	.....	3	24 hours
Mar. 17*	.....	.....	.....	3	15 hours
Mar. 18	.....	Mar. 23	12 P. M.	2	.....
Mar. 18*	.....	.....	.....	1	9 hours
Mar. 28*	3 P. M.	Mar. 28	12 P. M.	2	.....
Mar. 29	0 A. M.	April 6	12 P. M.	4	.....
April 7	0 A. M.	April 12	12 P. M.	3	.....
April 7*	0 A. M.	April 7	9 A. M.	1	.....
April 12*	.....	.....	.....	1	10 hours
April 13	0 A. M.	April 16	12 P. M.	4	.....
April 17	.....	.....	.....	1	9 hours
April 17	.....	.....	.....	3	24 hours
April 18	0 A. M.	April 22	12 P. M.	2	.....
April 18*	.....	.....	.....	1	12 hours
April 27	0 A. M.	April 27	12 P. M.	1	.....
April 23*	.....	.....	.....	1	12 hours
April 28	.....	.....	.....	1	9 hours
April 29	.....	June 30	.....	0	.....

* Additional short-time openings.

HUDSON RIVER BELOW DAM No. 1, NEAR WATERFORD

Gage No. 101

This station, established October 19, 1916, is located at the lower end of lock No. 1. The water-surface indicated is at the upper end of the pool maintained by the new Federal dam at Troy. The gage, No. 101, is a standard Type A gage in two sections. The lower section is secured to the north end of the west lower approach wall and has a range of 13 feet, between elevations 12.0 and 25.0. The upper section is secured to the lower end of the lower west thrust wall and has a range of 11 feet, between elevations 25.0 and 36.0. Standard bench-mark plugs are set in the walls adjacent to the gages, the one for the lower section being at elevation 24.0 (B. C. datum) and the one for the upper section being at elevation 27.0 (B. C. datum).

The gage is read twice daily — at 7 A. M. and 3 P. M. — to half-tenths and even hundredths.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW DAM No. 1, NEAR WATERFORD, for the year ended June 30, 1919. H. W. Steventon, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	17.20	16.82	17.12	18.44	20.28	18.34	19.29	18.45	a	20.51	18.95	18.56
2.....	17.92	16.74	16.65	18.31	20.06	18.31	19.65	18.29	19.85	20.26	19.18	18.44
3.....	17.38	16.60	16.84	18.08	19.62	18.19	20.21	18.28	a	20.21	19.64	18.44
4.....	17.12	16.71	17.12	18.01	19.50	18.06	19.66	18.00	a	20.22	19.3	18.15
5.....	17.02	16.60	16.94	17.87	19.15	18.26	18.88	17.94	a	20.33	19.66	18.06
6.....	17.25	16.65	17.00	18.28	19.00	18.38	18.80	17.86	a	20.45	20.38	17.84
7.....	17.14	16.80	17.14	17.86	18.88	18.15	18.60	17.89	a	20.86	19.91	17.83
8.....	16.95	17.02	16.76	18.88	18.38	18.11	18.50	17.90	a	21.1	20.01	17.58
9.....	17.15	16.85	16.65	18.82	18.34	18.01	18.65	17.62	18.45	21.14	19.68	17.48
10.....	17.20	17.15	16.55	18.56	18.18	18.43	19.45	a	a	21.43	19.92	17.92
11.....	17.32	17.00	16.90	18.23	18.02	18.72	19.00	a	a	21.54	20.19	17.82
12.....	17.28	16.68	16.92	18.10	18.10	18.28	18.60	a	19.70	23.84	20.39	17.64
13.....	17.28	17.05	16.90	17.98	18.18	18.10	18.98	a	19.38	24.88	20.71	17.58
14.....	17.55	16.88	17.24	17.90	18.04	18.24	18.73	a	19.14	23.95	20.2	17.44
15.....	17.80	17.00	16.84	17.78	17.60	18.76	18.54	a	18.84	22.68	19.8	17.26
16.....	17.98	16.80	16.82	17.82	17.82	19.84	18.45	17.80	18.61	21.72	19.42	17.59
17.....	17.75	16.78	16.82	17.58	17.83	19.48	18.33	a	18.81	21.21	19.35	17.84
18.....	17.62	16.68	16.81	17.57	17.56	19.78	18.34	a	19.74	21.55	20.18	17.96
19.....	17.70	16.70	17.26	17.38	19.55	18.84	18.21	a	20.36	21.09	20.38	17.7
20.....	17.48	16.45	17.10	17.27	19.62	18.21	18.24	a	19.98	20.42	20.07	17.73
21.....	17.30	16.77	17.45	18.06	19.50	18.35	18.26	a	20.24	20.22	19.85	17.54
22.....	16.90	16.78	17.98	18.40	19.31	18.34	18.07	a	20.39	19.88	19.89	17.30
23.....	17.15	16.65	17.45	18.22	18.94	18.86	18.09	17.42	20.44	19.56	20.78	17.30
24.....	16.85	16.71	17.52	18.22	18.80	20.00	18.92	a	20.34	19.42	21.12	17.25
25.....	16.80	16.75	17.42	18.03	18.70	20.58	19.60	a	20.28	19.54	21.11	17.20
26.....	16.80	16.51	17.82	18.10	18.60	21.29	18.72	a	20.16	19.36	21.29	17.04
27.....	16.70	16.50	20.02	18.58	18.30	20.40	19.11	a	19.91	19.38	20.6	17.04
28.....	16.50	16.71	19.36	18.23	18.24	20.06	18.76	a	21.84	19.24	20.43	17.06
29.....	16.68	16.67	18.77	18.33	17.94	19.67	18.56	.....	22.61	19.15	19.74	17.36
30.....	16.95	16.73	18.62	18.26	18.56	19.01	18.61	.....	21.90	19.26	19.18	17.54
31.....	16.95	16.88	.....	19.58	.....	18.46	18.45	.....	21.55	.....	18.96	.....

a No record.

HUDSON RIVER ABOVE FEDERAL DAM, TROY

This station is located at the upper end of the Federal lock at Troy and indicates the water-surface of the Hudson river above the Federal dam, completed November 18, 1915. The gage is an inlaid tile vertical staff on the east lock wall and is read twice daily—at 8 A. M. and 4 P. M.—to tenths. The zero of this gage is 2 feet below mean sea-level and 1.13 feet below Barge canal datum.

Records are taken and furnished by the United States Engineer Office, Albany, N. Y. Records obtained during construction prior to October 1, 1915, have not been published.

Daily elevation of water-surface (above M. S. L.) of HUDSON RIVER ABOVE FEDERAL DAM AT TROY, for the year ended June 30, 1919. J. D. Flenniken, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	17.17	16.77	17.07	18.12	19.72	18.12	18.37	18.17	18.42	19.97	18.62	18.22
2.....	17.82	16.72	16.62	17.87	19.47	17.97	19.17	18.02	19.42	19.62	18.67	18.17
3.....	17.32	16.62	16.67	17.82	19.12	18.02	19.82	17.72	18.97	19.42	19.17	18.17
4.....	17.17	16.57	16.97	17.82	18.97	17.92	19.27	17.87	18.72	19.47	19.02	17.87
5.....	17.12	16.62	16.77	17.77	18.77	17.97	18.67	17.77	18.67	19.57	19.22	17.87
6.....	17.17	16.62	16.87	17.97	18.62	18.12	18.42	17.82	19.02	19.67	19.52	17.67
7.....	17.12	16.82	17.02	17.92	18.42	18.07	18.32	17.77	18.72	19.97	19.27	17.62
8.....	17.02	16.92	16.72	18.52	18.22	17.82	18.37	17.72	18.47	20.12	19.32	17.47
9.....	16.97	16.72	16.67	18.42	18.17	17.82	18.47	17.47	18.37	20.07	19.12	17.37
10.....	17.17	17.02	16.57	18.27	17.87	18.27	18.47	17.42	19.92	20.27	19.27	17.72
11.....	17.42	16.97	16.72	18.02	17.87	18.42	18.32	17.62	19.67	20.37	19.67	17.67
12.....	17.17	16.72	16.72	17.77	17.92	18.17	18.42	17.62	19.27	21.87	19.82	17.52
13.....	17.07	16.82	16.82	17.77	18.02	18.02	18.17	17.52	18.87	22.37	20.02	17.47
14.....	17.37	16.87	17.17	17.67	17.87	18.07	18.07	17.52	18.82	21.87	19.57	17.27
15.....	17.77	17.02	16.72	17.72	17.57	18.52	18.07	17.62	18.57	20.97	19.12	17.27
16.....	17.92	16.67	16.77	17.67	17.62	19.42	17.97	17.67	18.37	20.37	18.92	17.52
17.....	17.67	16.77	16.72	17.52	17.77	19.12	18.07	17.72	18.47	19.97	18.92	17.67
18.....	17.47	16.67	17.17	17.52	17.67	18.82	18.02	17.72	19.27	20.27	19.47	17.77
19.....	17.57	16.67	17.17	17.42	19.07	18.37	17.92	17.62	19.87	19.92	19.62	17.52
20.....	17.42	16.57	17.07	17.12	19.17	17.92	17.97	17.57	19.42	19.57	19.52	17.62
21.....	17.17	16.72	17.37	17.92	19.02	18.17	17.97	17.52	19.62	19.37	19.12	17.32
22.....	16.87	16.72	17.77	18.22	18.67	18.17	17.92	17.47	19.67	19.17	19.27	17.07
23.....	17.02	16.67	17.37	18.02	18.67	18.57	17.92	17.32	19.77	18.92	19.77	17.17
24.....	16.87	16.67	17.47	17.97	18.47	19.67	18.42	17.37	19.52	18.82	19.97	17.17
25.....	16.82	16.77	17.42	17.87	18.42	20.12	18.62	17.52	19.47	18.92	20.02	17.07
26.....	16.77	16.52	17.82	17.92	18.57	20.47	18.62	17.57	19.42	18.82	20.02	16.97
27.....	16.67	16.52	19.42	18.32	18.12	19.87	18.57	17.82	19.32	18.87	19.62	17.07
28.....	16.67	16.62	18.87	18.02	17.97	19.37	18.47	17.67	19.62	18.72	19.62	17.27
29.....	16.67	16.62	18.42	18.02	17.87	18.92	18.37	.....	20.97	18.62	19.02	17.27
30.....	16.82	16.72	18.22	17.87	18.32	18.62	18.27	.....	20.47	18.72	18.62	17.52
31.....	16.87	16.77	.....	19.37	.....	18.27	18.17	.....	20.22	.....	18.42	.....

NOTE.—To reduce readings to B. C. datum, add 0.87. These figures represent the actual readings, minus two feet. Previous reports show correction applied to agree with title designation of "B. C. datum."

HUDSON RIVER BELOW FEDERAL DAM, TROY

This station, established May 1, 1916, is located at the lower end of the Federal lock at Troy and indicates the water-surface of the Hudson river below the Federal dam. The gage is an inlaid tile vertical staff on the east lock wall. The zero of this gage, which is at the plane of lowest low water in this vicinity (see description under "Hudson River at Albany," page 261), is 2 * feet below mean sea-level and 1.13 * feet below Barge canal datum. The water-surface was affected by the remains of the old State dam until July 26, 1916, when the removal of the old structure was completed.

Beginning July 1, 1917, the record at this station is that of lower low tide and lower high tide, taken to the nearest tenth of a foot.

* Emendation.—Erroneously published in the 1916, 1917 and 1918 State Engineer's reports as 16 feet and 15.13 feet, respectively.

Daily record of elevation (above M. S. L.) of LOWER HIGH TIDE IN HUDSON RIVER
BELOW FEDERAL DAM AT TROY, for the year ended June 30, 1919. J. D. Flen-
niken, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	4.1	3.8	4.4	4.4	6.8	2.8	5.2	3.0	6.1	7.8	5.7	5.5
2.....	4.5	3.1	3.4	4.4	6.1	4.6	6.7	2.2	6.5	6.8	6.0	5.4
3.....	3.0	3.9	3.9	4.0	5.1	4.8	7.1	2.9	6.1	6.6	6.2	5.0
4.....	3.7	3.4	4.1	3.8	5.7	4.7	5.9	4.1	6.0	6.6	5.7	4.4
5.....	3.1	3.5	4.3	4.7	4.7	3.0	4.6	4.0	5.3	7.1	5.9	4.2
6.....	4.1	3.3	4.1	4.2	5.5	3.9	5.1	3.3	5.3	7.5	6.0	3.8
7.....	3.7	3.4	3.6	4.0	4.8	4.5	5.8	3.6	5.1	7.9	6.2	4.2
8.....	3.2	3.8	3.3	7.3	4.3	4.4	5.7	3.6	5.0	7.7	6.0	3.8
9.....	3.8	3.6	3.6	4.9	5.1	4.2	5.6	3.1	6.7	7.9	5.2	4.2
10.....	4.4	4.2	3.3	4.7	3.8	3.9	5.0	2.5	6.8	8.7	6.2	4.2
11.....	3.9	4.0	4.4	4.4	3.8	5.1	3.9	4.1	6.4	9.5	7.5	4.2
12.....	3.4	3.6	4.0	4.2	4.3	4.7	3.2	4.2	5.6	13.9	7.2	4.1
13.....	3.7	3.7	4.0	4.2	4.2	4.2	3.6	3.8	5.0	14.2	7.7	4.4
14.....	3.2	3.7	4.0	4.2	4.5	5.2	3.7	4.7	4.4	13.5	7.7	4.5
15.....	4.0	3.0	3.7	3.4	4.3	5.6	4.1	4.8	4.8	11.2	6.7	4.5
16.....	4.1	3.6	4.2	3.6	3.8	6.3	4.0	4.1	5.0	9.3	6.3	4.5
17.....	4.0	3.6	4.3	3.8	4.6	5.9	4.0	2.8	5.2	8.5	6.2	4.6
18.....	3.9	2.7	3.8	4.0	5.8	6.2	4.4	3.4	6.5	8.5	6.9	4.4
19.....	4.0	3.2	4.5	4.4	6.6	5.0	4.4	2.1	6.8	7.4	7.0	4.4
20.....	4.0	2.8	4.2	4.8	6.7	4.6	4.2	2.8	6.3	6.6	6.6	4.0
21.....	3.8	3.2	3.8	4.6	6.1	4.4	4.1	3.5	6.7	6.0	6.1	3.4
22.....	3.8	3.3	4.0	4.8	5.5	4.3	4.1	3.7	5.9	5.3	6.9	3.7
23.....	3.6	3.7	4.0	4.7	4.6	5.5	3.5	4.3	5.9	5.4	7.8	3.6
24.....	3.3	3.8	4.0	4.5	4.5	6.4	4.4	2.1	5.7	5.8	7.9	4.0
25.....	3.9	3.5	3.9	4.6	4.0	8.7	3.6	3.1	6.1	5.2	7.8	4.0
26.....	4.0	3.8	5.7	4.1	3.9	8.6	4.7	3.6	6.0	4.5	8.0	4.5
27.....	3.9	3.4	5.9	4.6	3.9	6.9	4.5	3.9	6.5	4.9	7.1	5.0
28.....	3.9	4.4	5.8	4.6	4.2	0.0	4.4	4.5	9.5	5.7	7.1	3.5
29.....	4.0	3.7	5.2	4.5	4.9	5.0	4.7	.....	9.7	5.4	6.6	4.3
30.....	4.1	4.0	4.3	4.4	4.1	4.8	4.5	.....	8.3	5.2	5.8	4.7
31.....	3.0	3.5	.....	6.8	.....	4.8	4.0	.....	8.2	.....	5.8	.....

NOTE.—To reduce these elevations to Barge canal datum, add 0.87. These figures represent the actual readings, minus 2 feet.

GAGING OF STREAMS: HUDSON RIVER BASIN 261

Daily record of elevation (above M. S. L.) of LOWER LOW TIDE IN HUDSON RIVER
BELOW FEDERAL DAM AT TROY, for the year ended June 30, 1919. J. D. Flen-
niken, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.5	-0.2	-0.3	0.8	5.6	0.1	2.0	0.7	1.8	6.4	3.0	2.0
2.....	0.4	-0.2	-0.3	1.0	4.8	0.0	3.4	0.5	4.6	5.3	3.4	2.0
3.....	0.0	-0.6	0.2	1.0	3.4	1.6	5.5	0.5	3.9	4.9	4.0	1.4
4.....	-0.3	-0.1	0.5	0.5	3.0	1.2	4.2	1.4	2.5	5.0	3.5	1.1
5.....	-0.2	-0.0	0.1	0.8	2.3	0.5	3.1	1.3	3.5	5.2	4.0	1.1
6.....	0.5	-0.2	0.2	1.0	2.5	0.8	4.2	1.0	3.4	6.0	4.4	1.0
7.....	-0.2	0.0	-0.1	0.1	2.5	0.1	4.8	0.7	2.7	6.8	4.5	0.6
8.....	-0.3	0.2	-0.3	1.6	1.2	1.2	4.6	0.5	2.0	7.2	4.0	0.8
9.....	0.4	0.0	-0.1	2.5	1.7	1.0	4.6	0.3	2.2	7.1	3.6	0.8
10.....	0.3	0.3	-0.1	1.9	1.1	1.2	3.8	-0.2	6.1	7.6	4.2	0.8
11.....	0.4	0.5	-0.1	1.4	0.4	2.6	2.4	1.2	4.9	7.9	5.0	0.4
12.....	-0.1	0.0	0.5	1.0	0.6	2.0	1.7	0.9	3.9	9.4	6.0	0.8
13.....	-0.2	0.1	0.5	0.9	1.5	1.2	1.6	0.9	3.0	13.5	5.8	0.5
14.....	0.2	-0.1	-0.1	0.4	0.7	1.8	2.0	0.6	2.5	11.3	5.1	0.5
15.....	0.9	-0.5	-0.1	0.2	0.5	3.7	2.0	1.4	2.2	9.3	4.4	0.5
16.....	1.1	-0.4	0.2	0.3	0.2	4.6	2.0	0.8	2.4	8.0	4.0	0.7
17.....	0.1	-0.6	0.3	0.2	0.8	3.7	2.0	-0.1	2.8	6.5	4.1	1.0
18.....	0.2	-0.1	0.0	0.0	0.8	3.6	2.5	0.4	3.9	7.2	4.9	1.0
19.....	0.3	-0.5	0.5	-0.1	4.4	2.5	2.4	-0.2	5.6	6.1	5.2	1.0
20.....	-0.1	-0.4	0.4	0.7	4.0	1.6	2.0	-0.2	5.0	5.0	5.0	0.6
21.....	0.2	-0.4	0.2	0.8	3.9	1.9	2.5	0.2	5.0	4.3	4.2	0.3
22.....	-0.1	-0.2	0.6	1.6	3.4	1.8	2.5	0.6	5.3	3.4	4.2	-0.5
23.....	0.2	-0.3	0.2	1.4	2.5	2.6	1.7	1.0	5.1	3.5	6.4	0.3
24.....	-0.1	-0.2	0.4	1.1	2.1	3.8	2.4	-0.4	5.1	3.9	6.6	0.0
25.....	0.0	-0.5	0.0	1.2	1.8	6.1	2.1	-0.2	5.0	2.8	6.8	0.3
26.....	0.0	-0.2	0.8	1.2	0.9	7.1	3.3	0.5	4.7	2.8	6.4	0.6
27.....	0.0	0.0	4.6	1.7	1.2	5.6	2.9	0.2	4.6	3.0	5.5	0.7
28.....	-1.0	0.3	3.4	1.6	0.6	4.6	2.5	0.9	6.5	3.0	4.9	-1.0
29.....	0.2	0.2	1.5	1.7	1.7	3.0	2.4	.....	8.4	3.0	4.0	0.0
30.....	0.2	-0.3	1.7	1.2	1.1	2.7	1.5	.....	7.6	3.6	3.0	1.0
31.....	-0.8	0.8	.....	3.6	.....	1.8	1.6	.....	7.3	.....	2.5	.....

NOTE.— To reduce these elevations to Barge canal datum, add 0.87. These figures represent the actual readings, minus 2 feet.

HUDSON RIVER AT ALBANY

The following tables, furnished by the United States Engineer Office, Albany, N. Y., through the courtesy of Mr. John D. Myton, Assistant Engineer in charge, give the elevations of the lower high and lower low tide recorded daily by the automatic tide gage at the foot of State street, Albany, during the year ended June 30, 1919.

The elevations are referred to an assumed plane of lowest low water in the Hudson river at this locality, which is 2.0 feet below the mean sea-level at Sandy Hook, N. J., or 15.863 feet below the elevation of "Greenbush" bench-mark, as published in the Annual Report of the U. S. Coast and Geodetic Survey

for 1903, Appendix No. 3. The plane of mean low tide at Albany, as determined from the mean of observations taken July 3 to November 17, 1876, was about 13.40 feet below the Greenbush bench-mark and, as determined by observations taken during the same period in 1908 and 1909, was about 13.80 feet below that bench-mark.

To reduce elevations in the tables to Barge canal datum, subtract 1.13 feet.

Daily record of elevation of LOWER HIGH TIDE IN HUDSON RIVER AT ALBANY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	5.88	4.85	4.67	4.88	6.67	3.22	5.52	4.42	6.11	7.39	6.72	6.60
2.....	† 5.45	4.98	4.92	5.46	6.27	4.14	5.98	3.56	7.01	6.82	6.90	6.41
3.....	4.87	3.97	5.03	5.55	5.53	5.90	6.99	4.53	6.78	6.88	6.18	6.12
4.....	4.65	5.21	5.52	5.02	5.72	5.45	6.53	5.72	6.99	7.01	6.49	5.90
5.....	4.69	5.26	5.81	5.52	5.13	4.26	5.41	5.16	7.20	7.23	6.20	5.80
6.....	5.51	5.10	5.29	5.72	5.46	4.98	5.83	5.26	5.60	7.56	6.41	† 5.77
7.....	5.15	5.33	5.31	4.30	6.12	3.79	6.44	4.68	6.29	7.58	† 6.91	5.26
8.....	5.05	5.36	5.02	5.76	5.01	5.44	5.76	† 5.35	5.39	† 7.39	6.04	5.16
9.....	5.72	5.31	5.32	5.91	5.72	5.51	5.94	4.86	6.83	7.55	5.68	5.71
10.....	5.49	5.50	5.09	5.61	5.08	4.79	† 4.47	4.32	† 6.77	7.88	6.60	5.29
11.....	5.34	5.73	4.29	5.41	4.28	6.18	4.19	4.67	6.47	8.42	7.30	4.76
12.....	5.07	5.36	5.57	5.00	† 5.00	† 5.77	2.99	5.38	5.60	9.44	7.00	5.10
13.....	5.28	5.01	5.20	5.24	5.85	5.39	3.85	5.39	5.30	11.98	7.49	5.00
14.....	5.30	4.83	† 4.09	† 4.34	5.95	5.95	4.35	5.12	4.81	10.63	6.66	5.39
15.....	5.20	† 4.00	4.53	4.60	5.29	6.27	4.73	6.22	5.73	9.03	6.49	5.40
16.....	† 5.03	4.10	5.31	5.15	5.49	6.23	4.71	4.86	6.50	8.71	6.76	5.72
17.....	4.70	3.67	5.50	5.30	5.47	6.19	4.80	4.06	6.31	7.49	7.20	5.63
18.....	4.46	4.10	5.41	4.91	6.36	6.69	5.22	5.01	7.00	7.63	6.71	5.99
19.....	4.72	4.38	5.99	5.18	7.46	6.61	5.73	3.45	5.81	6.50	7.28	6.09
20.....	4.63	4.58	5.83	6.12	7.23	5.68	5.14	4.43	6.59	6.63	6.62	5.53
21.....	4.60	5.10	5.45	5.94	6.43	5.79	5.27	4.81	6.50	5.07	6.46	5.31
22.....	4.88	5.12	5.55	5.53	6.55	5.79	5.27	5.20	5.68	5.96	6.99	† 4.61
23.....	5.38	5.44	5.49	* 5.85	5.25	6.12	5.21	4.53	5.85	6.29	† 7.67	5.42
24.....	5.17	5.65	5.37	* 6.11	5.50	6.62	† 5.78	† 3.81	† 5.94	† 7.03	7.71	5.23
25.....	5.69	5.37	5.02	5.82	5.19	† 7.72	3.78	3.46	5.89	4.94	7.41	5.53
26.....	5.60	5.34	5.81	5.45	† 3.54	7.88	5.30	4.62	6.05	4.83	7.47	6.03
27.....	5.59	4.75	6.39	† 5.43	4.81	6.67	5.28	4.05	6.64	5.38	7.12	5.59
28.....	5.59	5.25	† 6.23	5.81	4.29	6.40	4.60	5.46	7.47	6.55	7.12	4.59
29.....	5.36	† 5.67	5.22	5.89	5.87	5.78	5.41	.....	7.57	5.98	6.73	6.00
30.....	5.58	4.57	5.64	5.88	4.18	5.65	4.92	.....	7.39	6.17	6.39	5.76
31.....	† 4.29	5.31	.....	6.37	.....	4.68	5.70	.....	8.02	.....	6.52	.....

† One tide only.

* One reading; only one tide records.

Daily record of elevation of LOWER LOW TIDE IN HUDSON RIVER AT ALBANY, for
the year ended June 30, 1919

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.41	1.69	1.53	2.43	† 5.38	1.15	3.48	1.91	† 3.92	6.19	3.89	3.51
2.....	2.27	1.84	1.72	2.82	5.41	† 2.40	3.11	1.27	5.36	5.33	3.99	3.50
3.....	1.61	1.09	2.28	† 2.71	3.89	3.13	5.76	1.47	4.61	5.13	4.54	3.11
4.....	1.27	1.95	† 2.59	2.05	3.75	2.83	4.87	2.79	4.36	5.18	4.27	2.66
5.....	1.66	1.97	2.37	2.44	3.67	1.79	4.15	2.84	4.60	5.49	4.57	2.75
6.....	2.27	† 1.89	2.31	2.70	3.38	2.11	5.14	2.45	4.06	5.91	4.73	2.50
7.....	1.70	1.97	2.07	1.65	3.72	1.70	5.31	2.35	3.80	6.50	5.00	2.06
8.....	† 1.91	2.12	1.68	2.91	2.48	2.86	4.88	2.14	3.55	6.60	4.35	2.46
9.....	1.79	2.08	2.08	3.54	3.05	2.81	4.54	2.02	3.31	6.69	4.15	2.66
10.....	2.39	1.97	2.10	3.23	2.53	2.64	3.76	1.64	5.85	7.30	4.76	2.38
11.....	2.29	2.63	1.75	2.93	1.94	3.50	2.93	2.85	5.05	7.57	† 6.07	2.00
12.....	1.90	2.05	2.71	2.58	2.21	3.30	2.01	† 3.14	4.33	10.00	6.04	2.40
13.....	1.88	2.04	2.63	2.53	2.95	2.78	2.55	2.79	3.49	11.62	6.00	† 2.45
14.....	2.10	1.97	2.10	1.83	2.48	3.27	† 2.94	2.64	† 3.24	† 10.86	5.92	2.30
15.....	2.40	1.47	2.03	1.84	2.31	3.89	3.24	3.27	3.39	8.74	4.91	2.41
16.....	2.54	1.51	2.28	2.05	1.88	† 4.83	3.26	2.54	3.74	7.51	4.79	2.51
17.....	1.97	1.17	2.22	2.06	† 2.47	4.38	3.26	1.48	3.76	6.62	4.65	2.73
18.....	1.97	1.35	2.11	1.51	2.71	4.32	3.62	1.93	4.48	6.81	5.42	2.71
19.....	2.19	1.36	2.59	† 1.97	5.02	3.64	3.92	1.28	5.50	5.92	5.39	2.84
20.....	1.79	1.46	† 2.48	2.57	4.91	2.99	3.55	1.10	5.00	5.42	5.25	2.25
21.....	1.70	1.86	2.10	2.81	4.39	3.27	3.79	2.12	5.30	4.50	4.88	1.91
22.....	1.76	† 1.99	2.47	2.86	4.25	3.08	3.58	2.55	5.11	3.88	4.77	1.19
23.....	2.08	1.74	2.11	2.94	3.27	3.68	3.41	3.08	4.90	4.08	6.28	1.93
24.....	† 2.02	2.09	2.27	* 2.83	3.29	5.03	3.99	0.95	4.78	4.40	6.33	1.88
25.....	1.86	1.66	2.09	2.81	3.08	5.89	3.17	1.73	5.17	3.23	6.33	2.27
26.....	2.11	1.83	2.61	2.73	2.04	6.65	4.72	1.84	4.83	3.33	6.25	2.54
27.....	2.01	1.13	4.96	2.92	2.65	5.52	4.22	1.96	5.11	3.57	5.38	† 2.82
28.....	1.90	1.87	4.12	3.15	2.04	4.83	3.76	2.68	6.40	3.93	5.02	1.20
29.....	2.10	2.50	2.80	3.10	3.11	3.94	† 3.87	.....	† 7.92	† 3.82	† 4.82	1.75
30.....	2.18	1.49	3.03	2.95	2.30	† 3.88	3.05	.....	6.79	3.45	3.98	2.72
31.....	1.29	2.17	.....	4.32	.....	2.73	2.95	.....	6.77	.....	3.66	.....

† One tide only.

* One reading; only one tide recorded.

DIFFERENCE IN TIME AND RANGE OF TIDES ON HUDSON RIVER

The following table, prepared by the Corps of Engineers, U. S. A., shows the difference in time between the occurrence of high or low tide at Albany and at various localities on the Hudson river from Troy to New York, also the amounts of mean tidal range at the same localities.

To obtain the actual time of any desired high or low tide at a given locality apply the correction indicated in the table to the time of the same tide at Albany.

LOCALITY	DISTANCE FROM ALBANY	DIFFER- ENCE	HIGH WATER		LOW WATER		MEAN RANGE
	Miles		Hours	Minutes	Hours	Minutes	Feet
Troy (Congress St.).....	6½	Add	0	23	0	36	2.82
Albany.....	0						2.88
Castleton.....	8½	Subtract	0	58	1	00	2.78
New Baltimore.....	15	Subtract	1	46	2	00	3.31
Stuyvesant.....	19	Subtract	2	08	2	29	3.50
Coxsackie.....	21	Subtract	2	35	2	57	3.66
Hudson.....	28	Subtract	3	00	3	45	4.08
Catskill.....	33	Subtract	3	18	3	56	4.30
Germanstown.....	39	Subtract	3	46	4	26	4.30
Saugerties-Tivoli.....	44	Subtract	4	19	4	50	4.60
Rondout-Rhinebeck.....	56	Subtract	4	28	5	10	5.30
Poughkeepsie.....	70	Subtract	4	57	5	47	5.10
New York (Governor's Island).....	145	Subtract	9	50	11	02	4.40

INDIAN RIVER

INDIAN LAKE RESERVOIR AT INDIAN LAKE

Location.—At the masonry storage dam at the outlet of Indian lake, about 2 miles south of Indian Lake village, Hamilton county, and about 7½ miles above the confluence of Indian river with the Hudson.

Drainage area.—131 square miles, including about 9.3 square miles of water-surface of Indian lake at the elevation of crest of spillway. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Records of stage and gate openings, July, 1900, to June 30, 1919.

Gages.—Elevation of water-surface in reservoir is determined by chain gage on the crest of the dam near the gate-house. Gage installed November 17, 1911, to replace staff gage previously maintained at the same point. Mean elevation of crest of spillway is at gage height, 33.38 feet. Widths of sluice-gate openings determined by gage scales at sides of gate-stems inside gate-house. Gages read by Lester Sevaria.

Extremes of stage.—Current year: Maximum elevation of water-surface in reservoir, 35.00 feet, May 3 and 4. Minimum elevation, 18.5 feet, September 18.

1900–1919: Maximum elevation recorded, 38.8 feet, March 28, 1913. Minimum elevation, 2.0 feet, March 9 to 18, 1907, and January 3 to 17, 1910.

Regulation.—At ordinary stages the discharge is completely regulated by the operation of the sluice-gates. Water is held in storage until needed to supplement the flow of the upper Hudson during the low-water period. This storage capacity of about 4.7 billion cubic feet provides for a discharge of approximately 600 second-feet for a period of 90 days.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Daily gage height, in feet, of INDIAN LAKE RESERVOIR AT INDIAN LAKE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	33.65	32.2	22.5	19.95	22.8	27.25	31.1	29.9	20.8	27.1	34.75	33.65
2.....	33.65	32.0	22.15	20.0	23.0	27.35	31.3	29.7	20.6	27.3	34.8	33.65
3.....	33.65	31.75	21.8	20.1	23.2	27.45	31.5	29.5	20.3	27.6	35.0	33.65
4.....	33.7	31.4	21.6	20.2	23.4	27.55	31.6	29.3	20.0	27.8	35.0	33.65
5.....	33.7	31.1	21.45	20.3	23.6	27.6	31.7	29.1	19.8	27.9	34.8	33.65
6.....	33.75	30.8	21.2	20.4	23.8	27.65	31.8	28.85	20.0	28.0	34.6	33.65
7.....	33.8	30.55	21.0	20.65	24.2	27.7	31.9	28.7	20.2	28.2	34.4	33.65
8.....	33.85	30.3	20.7	20.8	24.6	27.75	31.95	28.45	20.35	28.65	34.4	33.65
9.....	33.9	30.0	20.35	20.95	24.5	27.8	32.0	27.6	20.5	28.8	34.4	33.7
10.....	33.95	29.85	20.0	21.05	24.75	27.9	32.05	27.3	20.75	30.0	34.4	33.7
11.....	34.0	29.55	19.7	21.1	24.9	27.95	32.1	26.9	20.9	30.8	34.4	33.75
12.....	34.05	29.25	19.4	20.2	25.2	28.0	32.1	26.5	21.0	32.5	34.35	33.75
13.....	34.1	29.0	19.1	20.25	25.3	28.05	32.15	26.15	21.1	33.3	34.35	33.75
14.....	34.1	28.75	18.85	21.3	25.45	28.15	32.2	25.8	21.2	33.8	34.35	33.8
15.....	34.15	28.65	18.75	21.35	25.5	28.3	32.2	25.4	21.3	34.1	34.35	33.9
16.....	34.2	28.25	18.65	21.4	25.6	28.5	32.25	25.1	21.4	34.2	34.15	33.95
17.....	34.2	28.0	18.65	21.45	25.7	28.6	32.25	24.8	21.5	34.3	34.25	34.0
18.....	34.2	27.65	18.5	21.5	25.8	28.7	32.25	24.55	21.75	34.5	34.6	34.0
19.....	34.15	27.25	18.55	21.55	25.9	28.8	32.25	24.15	22.0	34.65	34.7	34.0
20.....	34.15	26.85	18.55	21.6	26.05	28.9	32.3	23.75	22.3	34.75	34.7	33.95
21.....	34.1	26.45	18.65	21.7	26.2	29.0	32.0	23.35	22.6	34.8	34.7	33.95
22.....	34.0	26.1	18.75	21.8	26.35	29.1	31.7	23.05	23.0	34.8	34.75	33.95
23.....	34.0	25.65	18.8	21.85	26.5	29.3	31.5	22.8	23.45	34.8	34.85	33.95
24.....	33.9	25.2	18.85	22.0	26.6	30.0	31.3	22.45	23.9	34.85	34.95	33.9
25.....	3..	24.9	18.9	22.1	26.7	30.3	31.2	22.05	24.2	34.9	34.95	33.9
26.....	33.5	24.45	19.05	22.2	26.75	30.5	31.1	21.7	24.5	34.85	34.75	33.9
27.....	33.35	24.05	19.35	22.3	26.8	30.7	30.95	21.45	24.9	34.	34.55	34.05
28.....	33.05	23.65	19.5	22.4	26.85	30.85	30.7	21.1	25.8	34.75	34.4	34.15
29.....	32.85	23.3	19.7	22.5	26.95	30.95	30.5	.....	26.2	34.75	34.4	34.15
30.....	32.5	23.0	19.85	22.6	27.1	31.0	30.3	.....	26.6	34.75	31.3	34.2
31.....	32.35	22.75	.....	22.7	.....	31.05	30.1	.....	26.9	.....	33.7	.....

Gate openings, in inches, at INDIAN LAKE RESERVOIR AT INDIAN LAKE, for the year ended June 30, 1919

From		To		Sluice-gate A open	Sluice-gate B open
Date	Hour	Date	Hour		
July 24.....	9 A. M.	July 25.....	6 P. M.	Inches	Inches
July 25.....	6 P. M.	July 27.....	5 P. M.	.....	54
July 27.....	5 P. M.	Sept. 14.....	4 P. M.	.....	30
Aug. 18.....	7 A. M.	Sept. 3.....	11 A. M.	.....	54
Sept. 7.....	5 P. M.	Sept. 20.....	6 P. M.	.....	60
Sept. 14.....	4 P. M.	Jan. 20.....	8 P. M.	.....	Closed
Sept. 20.....	6 P. M.	Feb. 6.....	1 P. M.	Closed	.....
Jan. 20.....	8 P. M.	Mar. 5.....	2 P. M.	.....	54
Feb. 6.....	1 P. M.	Mar. 5.....	2 P. M.	.....	60
April 15.....	9 P. M.	April 17.....	7 P. M.	.....	60
April 18.....	1 P. M.	April 18.....	7 P. M.	.....	60
May 6.....	4 P. M.	May 7.....	9 P. M.	.....	48
May 31.....	1 P. M.	June 1.....	1 P. M.	.....	60
June 1.....	.....	June 30.....	.....	Closed	.....

NOTE.—The main logway was open 1 foot in width from 7 P. M., August 3, to 7 A. M., August 18. It was open 15 feet during the following periods: May 5, 5 A. M. to 4 P. M.; May 16, 5 A. M. to 3 P. M.; May 26, 5 A. M. to 6 P. M.; May 27, 1 P. M. to 6 P. M.; May 28, 6 A. M. to 5 P. M. It was also open 7 feet 6 inches from 1 P. M., May 31, to 1 P. M., June 1.

INDIAN RIVER NEAR INDIAN LAKE

Location.—About $\frac{3}{4}$ mile below the State dam at the outlet of Indian lake, about 2 miles south of Indian Lake village, Hamilton county, 1 mile above the mouth of Big brook and $6\frac{1}{2}$ miles above the mouth of Indian river.

Drainage area.—132 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—July 1, 1912, to June 30, 1914; June 5, 1915, to June 30, 1919; also miscellaneous measurements in 1911.

Gage.—Gurley 7-day graph water-stage recorder, installed August 30, 1916. In standard wooden shelter on the right bank about $\frac{3}{4}$ mile below the dam, at same datum as staff gage previously used. The staff gage is still in place and used for checking the recorder. Recorder inspected by Lester Sevarie.

Discharge measurements.—Made from a cable or by wading at the head of the rapids about 150 feet below the gage.

Channel and control.—The gage is at the side of a pool about 500 feet wide, called the "lower frog-pond." The reef of coarse gravel at the outlet of this pool forms the control and is permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 5.88 feet at 9 A. M., May 5; discharge, 2,060 second-feet. Minimum stage from water-stage recorder, 0.04 foot at 5 A. M., October 2; discharge, 1.3 second-feet.

1912-1919: Maximum stage recorded, 7.8 feet at 4 P. M., March 28, 1913; discharge, 3,460 second-feet. Minimum stage from water-stage recorder, 0.07 foot at 12 P. M., September 30, 1918; discharge, about 0.7 second-foot.

Winter flow.—Discharge relation not affected by ice.

Regulation.—Discharge at this station is regulated by the operation of gates at the dam.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 15 and 1,500 second-feet. Daily discharge ascertained by applying mean daily gage height to rating table for days when there have been no changes in the sluice-gate openings at Indian lake dam. Mean daily gage height determined by

inspection of the hydrograph record. Discharge for days when gate openings are changed is mean of 24 hourly discharge values.

Coöperation.— Station maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of INDIAN RIVER NEAR INDIAN LAKE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
1918			
July 15 a.	J. W. Moulton	1.40	91.3
Nov. 14.	E. D. Burchard	0.25	5.28
1919			
Feb. 11.	E. D. Burchard	3.56	838
Apr. 6.	M. H. Carson	0.54	19.4

a Logs on control.

Daily gage height, in feet, of INDIAN RIVER NEAR INDIAN LAKE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.77	2.9	3.3	0.06	0.25	0.42	0.88	2.95	3.3	0.43	2.5	a
2.....	0.87	2.9	3.3	0.05	a	0.41	0.91	2.95	3.25	0.44	2.65	1.78
3.....	0.90	a	a	0.09	a	0.41	0.91	2.9	3.25	0.46	2.8	a
4.....	0.98	3.05	2.6	0.10	a	0.42	0.96	2.9	3.2	0.50	2.85	0.95
5.....	1.01	3.05	2.6	0.03	a	0.42	0.95	2.9	a	0.51	a	0.7
6.....	1.01	3.05	2.6	0.19	a	0.45	0.96	a	0.30	0.58	a	0.98
7.....	1.04	3.05	a	0.19	a	0.48	0.96	3.65	0.20	0.61	a	1.00
8.....	1.02	3.05	3.2	0.13	0.20	0.49	0.97	3.65	0.18	0.62	2.55	1.01
9.....	1.05	3.0	3.2	0.10	0.20	0.49	0.97	3.6	0.16	0.63	2.55	1.02
10.....	1.11	3.0	3.15	0.08	0.21	0.49	0.97	3.6	0.20	0.76	2.5	1.01
11.....	1.19	3.0	3.15	0.06	0.22	0.50	1.00	3.55	0.17	0.93	2.5	1.01
12.....	1.27	2.95	3.15	0.08	0.22	0.50	1.00	3.55	0.13	1.07	2.55	1.00
13.....	1.35	3.0	3.1	0.07	0.23	0.50	1.00	3.55	0.14	1.11	2.55	1.00
14.....	1.37	3.0	a	0.07	0.25	0.52	0.99	3.5	0.14	1.25	2.55	1.09
15.....	1.40	2.95	1.83	0.07	0.26	0.56	0.99	3.5	0.12	a	2.5	1.18
16.....	1.40	2.95	1.82	0.06	0.25	0.57	1.00	3.45	0.12	2.95	a	1.18
17.....	1.44	2.95	1.82	0.07	0.25	0.56	1.01	3.45	0.11	a	2.6	1.23
18.....	1.42	a	1.81	0.06	0.29	0.57	1.03	3.4	0.20	a	2.95	1.22
19.....	1.40	3.55	1.80	0.07	0.35	0.57	1.03	3.4	0.25	2.41	3.1	1.21
20.....	1.44	3.5	a	0.06	0.32	0.59	a	3.4	0.29	2.55	3.15	1.19
21.....	1.40	3.5	0.33	0.10	0.33	0.60	3.0	3.4	0.37	2.6	3.1	1.17
22.....	1.36	3.45	0.19	0.06	0.36	0.62	3.0	3.4	0.36	2.65	3.05	1.09
23.....	1.32	3.45	0.12	0.10	0.39	0.68	3.0	3.35	0.27	2.65	3.1	1.08
24.....	a	3.4	0.10	0.10	0.39	0.72	3.0	3.35	0.26	2.7	3.2	1.06
25.....	a	3.4	0.09	0.11	0.39	0.76	3.05	3.3	0.22	2.7	3.25	1.09
26.....	2.30	3.4	0.14	0.15	0.38	0.81	3.0	3.3	0.21	2.7	a	1.07
27.....	a	3.35	0.21	0.16	0.36	0.86	3.0	3.3	0.25	2.6	a	1.23
28.....	2.95	3.35	0.14	0.18	0.36	0.88	3.0	3.3	0.45	3.55	a	1.39
29.....	2.95	3.3	0.10	0.15	0.42	0.83	3.0	.....	0.46	2.49	2.55	1.41
30.....	2.9	3.3	0.09	0.20	0.44	0.87	2.95	.....	0.40	2.46	2.45	1.40
31.....	2.9	3.35	.....	0.36	.....	0.87	2.95	.....	0.41	.....	a	.....

a No record.

GAGING OF STREAMS: HUDSON RIVER BASIN 269

Daily discharge, in second-feet, of INDIAN RIVER NEAR INDIAN LAKE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	18	564	725	1.5	5.2	12	51	584	725	12	418	838
2.....	26	564	725	1.4	4.6	11	54	564	704	13	471	207
3.....	30	575	599	1.8	4.3	11	54	564	704	14	526	128
4.....	26	623	453	1.9	4.2	12	60	564	684	16	545	59
5.....	40	623	453	1.7	4.0	12	59	564	396	18	1,310	62
6.....	40	623	453	3.7	4.9	13	60	716	6.8	21	703	63
7.....	42	623	473	3.7	3.9	15	60	875	3.9	23	890	66
8.....	40	623	664	2.4	3.9	15	62	875	3.4	24	493	47
9.....	46	603	684	1.9	3.9	15	62	853	3.0	29	436	69
10.....	50	603	664	1.7	4.2	15	62	853	3.9	37	418	67
11.....	60	603	664	1.5	4.4	16	66	832	3.2	57	418	47
12.....	75	584	664	1.7	4.4	16	66	832	2.4	76	436	66
13.....	85	603	643	1.6	4.4	16	66	832	2.6	82	436	66
14.....	90	603	438	1.6	5.2	17	65	810	2.6	103	436	79
15.....	90	584	220	1.6	5.5	20	65	810	2.2	175	418	92
16.....	90	584	217	1.5	5.2	20	66	788	2.2	584	831	92
17.....	100	584	217	1.6	5.2	20	67	788	2.0	594	453	100
18.....	95	668	214	1.5	6.5	20	70	787	3.9	433	584	98
19.....	90	832	212	1.6	8.8	20	70	787	5.2	388	643	97
20.....	100	810	187	1.5	7.5	22	158	767	6.5	436	664	94
21.....	90	810	6	1.9	7.9	22	603	767	9.5	453	643	90
22.....	85	788	2	1.9	9.0	24	603	767	9.0	471	623	79
23.....	80	788	1	1.9	10.0	29	603	746	5.8	471	643	77
24.....	448	767	1	1.9	10.0	32	603	746	5.5	489	684	74
25.....	570	767	1	2.9	10.0	36	623	725	4.4	489	704	79
26.....	353	767	1	2.8	9.9	42	603	725	4.2	489	1,280	76
27.....	406	746	2	3.0	9.0	48	603	725	5.2	453	285	108
28.....	584	746	1	3.0	9.0	51	603	725	13	436	651	127
29.....	584	725	1	2.8	12.0	51	603	.....	14	415	436	121
30.....	564	725	1	3.9	13.0	49	584	.....	11	405	402	129
31.....	564	746	.....	9.9	.....	49	584	.....	11	.....	820	.....
Mean...	180	673	320	2.31	6.63	24.2	257	748	108	257	618	115

NOTE.— Discharge estimated, July 1 to 25, because of logs on the canal, from discharge measurements and study of gage-height graph. Discharge estimated, November 2 to 7, by computing discharge from record of gate openings at dam at Indian lake reservoir and comparing hydrograph of Hudson river near Indian Lake.

Monthly discharge of INDIAN RIVER NEAR INDIAN LAKE, for the year ended June 30, 1919

[Drainage area, 132 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	584	18	180	1.36	1.67
August.....	832	564	673	5.10	5.88
September.....	725	1	320	2.42	2.70
October.....	9.0	1.4	2.31	0.018	0.62
November.....	13.0	3.9	6.63	0.050	0.08
December.....	51	11	24.2	0.183	0.21
January.....	623	52	257	1.95	2.25
February.....	875	564	748	5.67	5.90
March.....	725	2.0	108	0.818	0.94
April.....	584	12	257	1.95	2.18
May.....	1,310	402	618	4.68	5.40
June.....	838	59	115	0.871	0.97
The year.....	1,310	1	276	2.09	23.08

SCHROON RIVER**DESCRIPTION**

Schroon river rises in Essex county, along the southern slopes of the highest mountains in the Adirondack group, flows in a general southerly direction for about 45 miles through Essex and Warren counties and joins the Hudson near Thurman. Its total drainage area is 550 square miles. Its headwaters reach an elevation of about 2,000 feet above mean tide; its mouth is at an elevation of about 600 feet.

Its basin is largely forested and contains considerable wild land and numerous lakes and ponds. The most important of these is Schroon lake, through which the river flows, which has a water-surface area of about 6.3 square miles. The only power-plants are at Warrensburg.

SCHROON RIVER AT RIVERBANK

Location.—At the steel highway bridge near Riverbank post-office, Warren county, near Tumblehead falls, about 9 miles below Schroon lake and about 9 miles above Warrensburg.

Drainage area.—534 square miles.

Records available.—September 2, 1907, to June 30, 1919.

Gage.—Chain, on upstream side of bridge; read by J. H. Roberts.

Discharge measurements.—Made from the upstream side of bridge.

Channel and control.—Gravel; occasionally shifting. Logs become lodged on the control for a portion of nearly every year.

Extremes of discharge.—Current year: Maximum stage recorded, 6.70 feet at 8 A. M. and 4 P. M., April 13; discharge, about 4,950 second-feet. Minimum stage recorded, 1.31 feet at 3 P. M., July 5; discharge, 122 second-feet.

1907–1919: Maximum stage recorded, 10.7 feet at 5 P. M., March 28, 1913; discharge, about 13,500 second-feet. Minimum stage recorded, 0.85 foot at 5 P. M., October 17, 1909; discharge, 28 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Flow affected by storage in Schroon and Brant lakes.

Accuracy.—Stage-discharge relation probably permanent during year. Affected by ice, January 9 to 14, and by logs on the control, March 26 to June 30. Rating curve well defined between 150 and 4,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results good for periods when the stage-discharge relation is not affected by ice or logs; fairly good for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of SCHROON RIVER AT RIVERBANK, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
July 12.....	J. W. Moulton.....	1.54	179
July 12.....	J. W. Moulton.....	1.54	180
1919			
Jan. 11 a.....	E. D. Burchard.....	3.29	729
Feb. 14.....	E. D. Burchard.....	2.27	425
May 10 b.....	O. W. Hartwell.....	3.32	1,330
June 18 b.....	C. C. Covert.....	2.52	524

a Partial ice cover on control.

b Logs on shallow part of control.

Daily gage height, in feet, of SCHROON RIVER AT RIVERBANK, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.6	1.6	1.55	2.15	3.9	3.7	3.0	2.65	2.2	5.6	3.6	3.6
2.....	1.44	1.6	1.5	2.0	4.0	3.3	3.1	2.6	2.25	5.4	3.6	3.5
3.....	1.34	1.6	1.45	2.15	4.0	3.3	3.1	2.55	2.25	5.1	3.7	3.3
4.....	1.34	1.55	1.44	2.05	4.1	3.3	3.1	2.5	2.3	4.9	3.6	3.6
5.....	1.36	1.55	1.45	2.2	4.0	3.2	3.1	2.5	2.4	4.8	3.7	3.4
6.....	1.38	1.5	1.43	2.4	3.9	3.2	3.2	2.5	2.35	4.6	3.7	3.1
7.....	1.45	1.5	1.45	2.8	3.8	3.0	3.2	2.45	2.45	4.8	3.7	2.75
8.....	1.38	1.45	1.55	3.4	3.7	3.0	2.9	2.4	2.45	5.1	3.8	3.0
9.....	1.35	1.44	1.45	3.5	3.5	2.95	2.9	2.4	2.7	5.1	3.8	2.8
10.....	1.45	1.41	1.42	3.4	3.4	2.95	3.2	2.35	2.8	5.2	3.8	2.75
11.....	1.48	1.55	1.48	3.3	3.5	2.85	3.3	2.3	2.75	5.5	3.1	3.3
12.....	1.5	1.55	1.47	3.2	3.2	2.9	3.4	2.3	2.75	6.2	4.0	3.0
13.....	1.5	1.55	1.5	3.6	3.2	3.0	3.2	2.3	2.85	6.7	4.0	3.3
14.....	1.55	1.55	1.5	3.7	3.1	3.1	2.9	2.25	2.75	6.6	4.0	2.45
15.....	1.7	1.6	1.49	3.0	3.0	3.0	2.85	2.25	2.75	6.0	4.1	2.45
16.....	1.7	1.55	1.48	2.1	3.0	3.1	3.0	2.2	2.75	5.9	3.8	3.3
17.....	1.8	1.55	2.4	2.3	3.0	3.1	2.85	2.2	2.8	5.9	3.8	3.5
18.....	1.9	1.45	2.75	2.35	3.1	3.1	2.8	2.2	2.9	5.7	3.9	3.5
19.....	1.9	1.49	2.55	2.35	3.6	3.1	2.75	2.2	3.1	5.6	4.0	3.1
20.....	1.8	1.43	1.7	2.3	4.0	3.0	2.8	2.15	3.5	5.4	4.1	3.5
21.....	1.8	1.41	1.6	2.45	4.0	2.95	2.85	2.1	3.7	5.2	4.0	2.25
22.....	1.8	1.40	1.55	2.5	4.1	2.95	2.7	2.1	4.1	5.0	4.3	2.2
23.....	1.8	1.43	2.1	2.6	4.1	2.7	2.65	2.05	4.4	4.8	5.2	2.2
24.....	1.75	1.43	2.1	2.6	4.0	2.8	2.8	2.1	4.5	4.6	5.6	2.2
25.....	1.75	1.39	2.1	2.4	4.0	3.0	2.9	2.05	4.6	4.5	5.7	2.25
26.....	1.7	1.39	2.2	2.6	3.8	3.2	2.8	2.0	4.5	4.4	5.6	2.4
27.....	1.65	1.38	1.9	2.5	3.7	3.2	2.8	2.0	4.5	4.2	5.0	3.5
28.....	1.65	1.40	2.05	2.6	3.5	3.2	2.8	2.05	4.7	3.9	4.8	3.0
29.....	1.7	1.38	2.05	2.65	3.6	3.2	2.8	.....	5.5	3.9	4.4	2.2
30.....	1.7	1.39	2.1	2.7	3.5	3.2	2.75	.....	5.9	a	4.2	2.45
31.....	1.65	1.35	.....	3.2	.....	3.0	2.7	.....	5.9	.....	4.0	.....

a No record.

GAGING OF STREAMS: HUDSON RIVER BASIN 273

Daily discharge, in second-feet, of SCHROON RIVER AT RIVERBANK, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	585	201	184	383	1,480	1,290	800	610	407	3,200	1,100	1,300
2.....	156	201	172	333	1,550	990	860	585	427	3,000	1,100	1,100
3.....	180	204	158	389	1,650	990	840	500	427	2,800	1,200	1,000
4.....	130	186	156	351	1,640	990	86	535	447	2,400	1,100	1,100
5.....	135	186	158	407	1,550	920	86	535	490	2,200	1,300	1,100
6.....	140	172	153	490	1,480	920	92	535	468	2,200	1,200	890
7.....	159	172	258	690	1,370	800	92	512	512	2,400	1,300	680
8.....	1 0	158	183	1,060	1,290	880	745	490	512	2,600	1,400	750
9.....	132	156	158	1,130	1,130	772	75	490	435	2,800	1,400	700
10.....	158	148	150	1,060	1,060	772	75	468	690	2,800	1,400	650
11.....	167	186	167	990	1,130	718	750	447	662	3,000	1,600	1,000
12.....	172	180	191	920	920	745	70	447	662	4,800	1,500	750
13.....	172	186	172	1,210	920	800	700	447	718	4,800	1,500	900
14.....	186	186	172	1,290	840	660	700	427	662	4,400	1,500	500
15.....	232	201	769	800	800	800	718	427	662	3,800	1,600	800
16.....	252	186	167	369	800	860	800	407	662	3,800	1,400	420
17.....	204	186	490	447	800	860	718	407	690	3,600	1,400	500
18.....	298	158	602	468	860	860	600	407	745	3,400	1,400	800
19.....	298	160	560	468	1,210	840	662	407	860	3,200	1,500	360
20.....	264	153	232	447	1,550	800	660	368	1,130	3,000	1,600	580
21.....	264	148	201	512	1,550	772	718	369	1,290	2,800	1,800	400
22.....	264	145	186	535	1,640	772	635	369	1,640	2,400	1,700	380
23.....	264	153	369	585	1,640	635	610	351	1,900	2,400	2,800	390
24.....	218	153	369	585	1,650	690	690	369	2,010	2,200	3,200	380
25.....	248	142	309	490	1,550	800	745	351	2,150	2,000	3,400	420
26.....	262	142	407	585	1,370	920	690	333	2,000	1,800	3,400	460
27.....	216	140	298	535	1,290	920	690	333	2,000	1,600	2,600	560
28.....	216	145	351	585	1,130	920	690	351	2,300	1,600	2,400	320
29.....	232	140	851	610	1,210	820	690	.....	3,080	1,400	1,800	280
30.....	232	112	369	635	1,130	920	662	.....	3,600	1,400	1,700	500
31.....	216	132	.....	920	.....	800	635	.....	3,600	.....	1,600	.....
Mean...	219	166	202	654	1,270	864	730	441	1,220	2,770	1,730	635

NOTE.—Stage-discharge relation affected by ice, January 9 to 14, and by logs on control, March 26 to June 30. Daily discharge for these periods is approximate.

Monthly discharge of SCHROON RIVER AT RIVERBANK, for the year ended June 30, 1919

(Drainage area, 531 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	585	130	219	0.410	0.47
August.....	201	132	166	0.311	0.36
September.....	662	153	262	0.492	0.56
October.....	1,290	333	654	1.22	1.41
November.....	1,640	800	1,270	2.38	2.66
December.....	1,290	635	854	1.60	1.85
January.....	820	610	730	1.38	1.59
February.....	610	333	441	0.826	0.86
March.....	3,660	467	1,220	2.28	2.68
April.....	4,800	1,400	2,770	5.19	5.79
May.....	3,406	1,100	1,730	3.24	3.74
June.....	1,100	320	635	1.19	1.33
The year.....	4,800	130	913	1.71	23.24

SACANDAGA RIVER

DESCRIPTION

Sacandaga river is one of the larger tributaries of the upper Hudson. It drains extensive portions of the southeast slope of the Adirondack region as well as a portion of the plateau lying north of Mohawk river and south of the Adirondack mountains. The headwaters of the stream rise in the slopes surrounding Lake Pleasant, Sacandaga and Piseco lakes. It is formed by three principal branches, which unite in the southeastern part of Hamilton county. The west branch is the outlet at Piseco lake, the middle branch is the outlet of Sacandaga and Pleasant lakes, the east and principal branch issues from a series of small ponds and lakes in the southwestern part of Warren county. Sacandaga lake, the highest of the tributary lakes in the headwaters, is about 1,700 feet above mean tide. The east and middle branches unite a few miles north of Wells and are joined by the west branch a short distance below Wells. The river then flows southeasterly to a point about five miles below Northville. Above Northville the drainage basin is rugged and almost completely forest-covered. From Northville to Conklingville the stream winds through a sandy valley flanked by steep slopes. The width of this valley averages about one mile from Northampton to Conklingville. Above Northampton is an extensive flat lying at an elevation of about 740 feet. This flat is drained by Mayville, Vly and Hann's creeks and contains extensive swamp areas. From Northville to Conklingville, a distance along the general course of the stream of about 22 miles, there is very little fall. The elevation at Conklingville is about 720 feet. Sacandaga river enters Hudson river at Luzerne at elevation about 540 feet. Between Northville and the mouth of the river there is a fall of about 180 feet (chiefly concentrated in the five miles below Conklingville) entirely unutilized. There are, in fact, no power developments on the Sacandaga.

The drainage area of this river, about 1,060 square miles, is largely in forest. The mean precipitation is high, being about 49 inches, whereas the mean for the whole Hudson drainage area above Mechanicville is only about 43 inches.

SACANDAGA RIVER NEAR HOPE

Location.—About $1\frac{1}{2}$ miles below the junction of east and west branches, $3\frac{1}{4}$ miles above Hope post-office, Hamilton county, and 12 miles above Northville.

Drainage area.—494 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—September 15, 1911, to June 30, 1919.

Gage.—Staff, in two sections, the lower inclined, the upper vertical; read by Melvin Willis.

Discharge measurements.—Made from cable about 100 feet below the gage or by wading.

Channel and control.—Rocky; probably permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 7.0 feet at 7:15 A. M., April 12; discharge, 9,540 second-feet. Minimum stage recorded, 1.28 feet at 6:30 P. M., August 28, and 7:20 A. M., August 29; discharge, 37 second-feet.

1911–1919: Maximum stage recorded, 10.0 feet at 5:30 P. M., March 27, 1913; discharge, 24,800 second-feet. Minimum stage recorded, 1.17 feet at 7:55 A. M., September 30, 1913; discharge, about 20 second-feet.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation permanent; affected by ice for a large portion of the period, December to March, inclusive. Rating curve well defined between 60 and 10,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good for periods when the stage-discharge relation is not affected by ice. Results fair for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of SACANDAGA RIVER NEAR HOPE, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918			
Oct. 24.....	E. D. Burchard.....	Feet 2.66	Sec-ft. 683
1919			
June 21.....	C. C. Covert.....	2.12	272

Daily gage height, in feet, of SACANDAGA RIVER NEAR HOPE, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.20	1.69	2.70	2.23	3.90	2.90	3.25	2.70	3.25	5.20	3.70	3.05
2.....	2.22	1.66	2.25	2.18	3.80	2.70	3.30	2.60	3.60	5.20	4.70	2.80
3.....	2.12	1.64	1.89	2.12	3.70	2.75	3.80	2.45	3.50	5.20	4.60	2.65
4.....	2.08	1.59	1.68	2.02	3.60	2.75	3.70	2.44	3.40	5.20	4.50	2.48
5.....	2.02	1.55	1.68	1.96	3.60	2.70	3.50	2.41	3.40	5.50	4.40	2.35
6.....	1.99	1.56	1.95	1.90	4.70	2.50	3.30	2.40	3.90	5.60	4.40	2.50
7.....	2.00	1.54	1.82	1.86	6.00	2.45	3.20	2.38	4.00	5.60	4.30	2.45
8.....	1.98	1.51	1.78	1.82	5.40	2.40	3.15	2.37	3.80	5.60	4.30	2.81
9.....	1.98	1.84	1.75	1.78	5.10	2.27	3.10	2.36	3.80	5.60	4.20	2.26
10.....	2.22	1.78	1.74	1.72	4.80	2.34	3.10	2.34	3.90	5.60	4.00	2.22
11.....	2.12	1.74	1.85	1.68	4.10	2.45	3.05	2.32	4.00	5.80	4.10	2.16
12.....	2.12	1.72	1.90	1.58	3.90	2.60	3.00	2.30	4.10	6.80	4.10	2.13
13.....	2.08	1.68	1.91	1.52	3.80	2.65	2.95	2.28	4.20	5.50	4.00	2.10
14.....	2.38	1.62	1.98	1.52	3.70	3.25	2.90	2.28	4.20	4.70	3.90	2.08
15.....	2.31	1.59	1.96	1.62	3.60	3.70	2.90	2.25	4.30	4.60	3.80	2.28
16.....	2.28	1.56	1.88	1.75	3.50	3.40	2.80	2.28	4.40	4.50	3.80	2.22
17.....	2.24	1.52	1.88	1.72	3.50	2.95	2.85	2.32	4.50	4.40	3.90	2.16
18.....	2.19	1.50	2.05	1.70	4.00	2.85	2.80	2.38	4.60	4.30	4.60	2.14
19.....	2.12	1.45	2.02	1.85	4.10	2.85	2.80	2.40	4.60	4.30	4.40	2.09
20.....	2.03	1.44	2.02	2.25	4.00	2.80	2.75	2.45	4.60	4.20	4.30	2.06
21.....	2.02	1.43	2.20	3.00	3.80	2.75	2.80	2.48	4.70	4.00	4.20	2.02
22.....	1.98	1.41	2.26	2.90	3.60	3.00	2.90	2.50	5.20	3.80	4.20	1.96
23.....	1.90	1.39	2.30	2.80	3.50	4.60	3.10	2.50	5.80	3.70	4.20	1.92
24.....	1.84	1.36	2.24	3.15	3.40	4.50	3.60	2.60	5.70	3.70	4.60	1.82
25.....	1.78	1.34	2.20	4.20	3.10	5.10	3.60	2.55	5.70	3.80	4.60	1.78
26.....	1.75	1.33	2.20	4.20	2.70	4.60	3.25	2.50	5.60	3.60	4.40	1.90
27.....	1.70	1.31	2.16	4.70	2.65	4.10	3.10	2.60	5.50	3.60	4.10	1.96
28.....	1.70	1.29	2.21	4.90	2.70	3.80	3.00	2.45	5.20	3.50	3.80	1.92
29.....	1.67	1.30	2.25	4.50	2.95	3.60	2.90	.....	5.10	3.50	3.60	1.88
30.....	1.72	1.36	2.28	4.10	3.25	3.50	2.80	.....	5.10	3.40	3.40	1.82
31.....	1.74	1.34	.....	4.00	.....	3.60	2.80	.....	5.20	.....	3.20	.....

GAGING OF STREAMS: HUDSON RIVER BASIN 277

Daily discharge, in second-feet, of SACANDAGA RIVER NEAR HOPE, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	319	114	590		1,150	740	1,000	590	1,060	4,230	1,560	865
2	320	106	335		1,150	590	1,110	525	1,440	4,230	3,130	660
3	273	101	175		1,150	625	1,680	438	1,390	4,230	2,930	558
4	255	89	111		1,150	625	1,560	432	1,220	4,480	2,740	454
5	230	81	111		1,150	590	1,330	416	1,230	4,090	2,500	385
6	217	83	202		1,150	463	1,110	410	1,810	5,250	2,590	465
7	221	79	154		1,150	438	1,010	400	1,940	5,250	2,390	438
8	213	78	141		1,150	410	960	395	1,680	5,250	2,390	385
9	213	161	132		1,150	395	910	390	1,680	5,250	2,230	340
10	320	141	128		1,150	380	910	380	1,810	5,250	1,940	320
11	273	128	184		1,150	438	865	370	1,940	5,790	2,090	292
12	273	128	182		1,150	525	890	360	2,080	9,890	2,090	278
13	255	111	186		1,150	558	780	350	2,230	4,990	1,940	264
14	400	96	213		1,150	1,000	740	340	2,390	3,130	1,810	255
15	365	89	205		1,150	1,560	740	335	2,390	2,930	1,680	350
16	350	83	175		1,150	1,220	740	350	2,560	2,740	1,680	320
17	330	74	175		1,380	780	700	370	2,740	2,560	1,810	292
18	305	71	242		1,940	700	660	400	2,930	2,390	2,930	282
19	273	63	280		2,090	700	660	410	2,830	2,390	2,560	260
20	255	61	230		1,940	660	625	438	2,930	2,230	2,390	247
21	230	59	310		1,080	625	600	454	3,130	1,940	2,390	230
22	213	56	340		1,440	820	740	465	4,480	1,680	2,230	205
23	182	52	300		1,330	2,980	910	465	5,790	1,560	2,230	190
24	161	48	330		1,220	2,740	1,440	525	5,520	1,560	2,930	154
25	141	45	310		910	3,990	1,440	495	5,520	1,680	2,930	141
26	132	44	310		590	2,980	1,060	465	5,250	1,440	2,560	182
27	116	40	292		558	2,080	910	465	4,990	1,330	2,080	205
28	116	38	315		590	1,680	820	465	4,230	1,330	1,660	190
29	108	38	335		780	1,440	740		3,990	1,330	1,440	175
30	122	48	350		1,080	1,330	660		3,990	1,220	1,220	154
31	128	45				1,330	660		4,230		1,010	
Mean	235	78.9	244	600	1,190	1,140	936	424	2,940	3,380	2,190	317

NOTE. — Monthly discharge estimated for October by comparison with Hadley station on basis of drainage area. Discharge estimated, November 1-18, as 1,150 second-feet. Daily gage height for these periods probably inaccurate.

Monthly discharge of SACANDAGA RIVER NEAR HOPE, for the year ended June 30,
1919

[Drainage area, 494 square miles]

MONTH	DISCHARGE IN SECOND-FEET				Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July	400	108	235	0.478	0.55
August	161	38	78.9	0.160	0.18
September	590	111	244	0.494	0.55
October			600	1.21	1.40
November			1,190	2.41	2.69
December	3,990	380	1,140	2.31	2.66
January	1,680	625	936	1.89	2.18
February	590	335	424	0.860	0.90
March	5,790	1,060	2,940	5.95	6.86
April	8,890	1,230	3,380	6.84	7.63
May	3,130	1,010	2,190	4.43	5.11
June	865	141	317	0.64	0.71
The year			1,140	2.31	31.42

SACANDAGA RIVER AT HADLEY

Location.—About $\frac{1}{2}$ mile west of railroad station at Hadley, Saratoga county, 1 mile above mouth of river and $4\frac{1}{2}$ miles below site of proposed storage dam at Conklingville.

Drainage area.—1,060 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—January 1, 1911, to June 30, 1919. September 13, 1907, to December 31, 1910, at upper bridge station; September 24, 1910, to midsummer of 1911, at lower bridge station.

Gage.—Gurley repeating hydrograph water-stage recorder in a concrete shelter on the left bank about $\frac{1}{2}$ mile west of railroad station at Hadley.

This recorder was installed January 6, 1916, replacing a Barrett and Lawrence recorder. Recorder inspected by J. F. Kelly.

Discharge measurements.—Made from a cable about 30 feet above the gage or by wading under the cable or about $\frac{3}{4}$ mile above gage.

Channel and control.—Very rough but permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 8.30 feet at 5 p. m., April 13; discharge, 11,900 second-feet. Minimum stage from water-stage recorder, 2.36 feet at 10 p. m., August 28; discharge, 92 second-feet.

1911–1919: Maximum stage from water-stage recorder, 12.36 feet from 11 a. m. to 12 noon, March 28, 1913; discharge, about 35,500 second-feet. Minimum stage from water-stage recorder, 2.25 feet, all day September 15, 1913; discharge, about 61 second-feet.

Ice.—Stage-discharge relation not affected by ice.

Accuracy.—Stage-discharge relation permanent; affected by ice during a large part of period from December to March, inclusive. Rating curve well defined between 150 and 20,000 second-feet. Operation of water-stage recorder satisfactory throughout the year. Daily discharge ascertained by applying to the rating table mean daily gage heights determined by inspecting gage height graph. Results excellent for periods when the stage-discharge relation is not affected by ice. Results fairly good for other periods.

GAGING OF STREAMS: HUDSON RIVER BASIN 279

Coöperation.— Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of SACANDAGA RIVER AT HADLEY, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 11.....	J. W. Moulton.....	3.29	607
July 11.....	J. W. Moulton.....	3.31	599
1919			
Jan. 16.....	E. D. Burchard.....	4.09	1,270

Daily gage height, in feet, of SACANDAGA RIVER NEAR HADLEY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.28	2.77	a	4.41	6.2	4.5	5.1	4.03	a	6.85	4.95	4.5
2.....	3.37	2.77	a	4.16	6.35	a	5.2	3.90	4.01	6.45	5.7	4.3
3.....	3.52	2.73	3.29	3.99	6.15	4.10	5.5	3.81	4.30	6.1	6.15	4.1
4.....	3.42	2.71	3.03	3.93	5.85	4.20	5.45	3.75	4.49	5.85	6.3	3.93
5.....	3.30	2.68	2.86	3.74	5.55	4.20	5.05	3.70	4.6	5.8	6.25	3.8
6.....	3.23	2.66	2.84	3.88	5.3	4.07	4.7	3.68	4.85	5.9	6.2	3.67
7.....	3.16	2.65	2.89	4.36	5.0	3.85	4.6	3.61	5.1	6.05	6.1	3.60
8.....	3.20	2.62	3.04	4.44	4.8	3.89	4.55	3.57	5.15	6.35	6.05	3.55
9.....	3.15	2.71	2.96	4.32	4.55	4.01	4.57	3.50	5.25	6.6	6.0	3.60
10.....	3.16	2.80	2.85	4.13	4.45	4.17	4.45	3.53	5.7	6.85	5.8	3.71
11.....	3.30	2.92	2.78	3.96	4.40	4.90	4.25	a	5.8	7.1	5.75	3.72
12.....	3.39	2.91	2.73	3.84	4.30	3.90	4.17	a	5.85	7.6	5.9	3.65
13.....	3.45	2.89	2.72	3.72	4.18	3.92	4.08	3.48	5.9	8.2	6.06	3.54
14.....	3.56	2.86	2.80	3.65	4.13	3.94	4.08	3.36	5.6	8.1	6.0	3.45
15.....	3.84	2.82	2.96	3.60	4.06	4.20	4.08	3.41	5.4	7.5	5.85	3.41
16.....	3.93	2.76	3.00	3.54	3.99	4.85	4.10	3.52	5.2	7.0	5.6	3.76
17.....	3.81	2.71	2.94	3.46	3.93	5.1	4.11	a	4.9	6.75	5.4	3.91
18.....	3.80	2.70	2.93	3.48	a	5.0	3.93	3.75	5.1	6.6	5.5	3.98
19.....	3.82	2.63	3.13	3.52	5.55	4.75	3.89	a	5.6	6.45	5.75	3.79
20.....	3.68	2.60	3.32	3.47	5.75	4.48	3.89	a	5.95	6.2	5.7	3.56
21.....	3.51	2.56	3.48	3.85	5.7	4.33	3.80	3.49	6.3	5.95	5.55	3.40
22.....	3.37	2.53	3.62	4.55	5.5	4.30	3.78	3.34	a	5.7	5.8	3.26
23.....	3.21	2.52	3.62	4.55	5.25	a	3.75	3.32	6.8	5.45	6.35	3.17
24.....	3.12	2.50	3.48	4.43	5.0	5.6	a	3.30	6.85	5.3	6.6	3.06
25.....	3.08	2.49	3.41	4.24	4.7	5.9	4.6	3.35	6.85	5.35	6.75	3.00
26.....	3.06	2.46	a	4.10	4.46	6.8	4.8	3.30	6.75	5.35	6.7	2.95
27.....	2.98	2.44	a	4.23	4.09	6.9	4.7	3.37	6.65	5.25	6.45	2.95
28.....	2.87	2.39	5.3	4.35	4.10	6.55	4.55	a	7.2	5.05	6.15	a
29.....	2.84	2.39	5.05	4.28	4.31	6.1	4.40	.....	7.3	5.0	5.8	4.45
30.....	2.80	2.41	4.75	4.28	4.47	5.65	4.28	.....	7.2	5.0	5.35	4.00
31.....	2.77	2.45	.....	5.4	.....	5.25	4.16	.....	7.1	.....	4.95	.....

a No record.

Daily discharge, in second-feet, of SACANDAGA RIVER AT HADLEY, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	539	250	214	1,660	5,210	1,800	2,780	1,190	865	6,980	2,520	1,800
2.....	601	250	631	1,340	5,688	1,298	2,980	1,068	1,170	5,888	3,988	1,520
3.....	714	232	645	1,150	5,688	1,270	3,560	966	1,520	4,950	5,080	1,270
4.....	637	222	383	1,090	4,340	1,390	3,460	910	1,780	4,340	5,470	1,090
5.....	583	210	293	961	3,688	1,388	2,688	864	1,988	4,288	5,348	966
6.....	506	201	283	1,040	3,150	1,240	2,110	847	2,350	4,480	5,210	838
7.....	461	197	307	1,600	2,600	1,010	1,950	787	2,780	4,320	4,950	778
8.....	486	184	389	1,710	2,270	1,040	1,880	745	2,870	5,800	4,820	738
9.....	465	233	344	1,540	1,888	1,170	1,988	688	3,088	6,270	4,798	778
10.....	461	263	288	1,310	1,720	1,350	1,720	722	3,990	6,980	4,328	873
11.....	582	323	254	1,120	1,650	1,240	1,450	869	4,228	7,740	4,100	862
12.....	615	317	232	996	1,520	1,080	1,350	801	4,340	9,370	4,469	821
13.....	680	307	227	882	1,370	1,080	1,250	683	4,480	11,500	4,820	730
14.....	746	292	263	821	1,310	1,100	1,250	534	3,770	11,100	4,700	680
15.....	988	273	344	778	1,220	1,388	1,288	630	3,388	9,038	4,348	680
16.....	1,090	245	366	730	1,150	2,350	1,270	714	2,980	7,430	3,770	919
17.....	966	222	334	668	1,090	2,780	1,280	939	2,430	6,700	3,350	1,070
18.....	956	218	328	683	1,630	2,600	1,090	940	2,780	6,270	3,563	1,140
19.....	976	189	443	714	3,660	2,190	1,040	917	3,770	5,860	4,100	917
20.....	847	176	566	675	4,108	1,770	1,040	824	4,580	5,210	3,990	746
21.....	706	161	683	1,010	3,990	1,580	956	690	5,470	4,580	3,663	622
22.....	601	149	795	1,880	3,560	1,520	938	580	6,180	3,980	4,220	526
23.....	493	146	795	1,880	3,060	2,640	910	568	6,480	3,460	5,600	467
24.....	436	138	683	1,700	2,600	3,770	1,480	552	6,980	3,150	6,270	401
25.....	412	135	630	1,440	2,110	4,460	1,950	587	6,980	3,250	6,700	396
26.....	401	124	1,040	1,270	1,740	6,840	2,270	552	6,780	3,250	6,580	339
27.....	355	118	2,840	1,430	1,260	7,138	2,118	601	6,410	3,060	5,863	363
28.....	297	101	3,150	1,580	1,270	6,148	1,838	652	8,088	2,648	5,080	1,460
29.....	283	101	2,690	1,490	1,530	4,950	1,650	.....	8,370	2,608	4,220	1,720
30.....	263	107	2,190	1,490	1,760	3,888	1,490	.....	8,088	2,600	3,250	1,160
31.....	250	121	.....	3,350	.....	3,060	1,340	.....	7,740	.....	2,520	.....
Mean...	591	280	751	1,290	2,570	2,470	1,750	786	4,419	5,539	4,560	686

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of SACANDAGA RIVER AT HADLEY, for the year ended June 30,
1919

[Drainage area, 1,060 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,090	250	591	0.558	0.64
August.....	323	101	200	0.189	0.22
September.....	3,150	214	751	0.708	0.78
October.....	3,359	668	1,290	1.22	1.41
November.....	5,608	1,090	2,570	2.42	2.70
December.....	7,130	1,010	2,470	2.33	2.69
January.....	3,560	910	1,750	1.65	1.90
February.....	1,190	552	766	0.723	0.75
March.....	8,370	865	4,410	4.16	4.80
April.....	11,500	2,600	5,580	5.26	5.87
May.....	6,700	2,520	4,560	4.30	4.96
June.....	1,800	339	886	0.836	0.93
The year.....	11,500	101	2,152	2.03	27.66

HOOSIC RIVER

DESCRIPTION

Hoosic river has its sources on the west slope of the Hoosic mountains in Vermont and Massachusetts. Two head branches, one flowing southward, the other northward along the west slope of this range, unite at North Adams, Mass., and the stream then flows northwestward, entering the Hudson three miles north of Mechanicville. Above Buskirk the drainage basin is rugged and precipitous, the distribution of tributaries affording rapid concentration of the run-off from the steep rock slopes. The ridges are sparsely wooded. The soil in the valleys is generally firm and tenacious. The general elevation of the valley at the junction of the headwaters is 1,000 feet. Numerous dams, affording power for textile, agricultural implement and other industries, are scattered throughout the length of the stream from North Adams to Schaghticoke. The drainage basin contains no important lakes and but one storage reservoir, that at Farnum, near the head of the south branch.

HOOSIC RIVER NEAR EAGLE BRIDGE

Location.—One-half mile below Walloomsac river and $1\frac{1}{2}$ miles above Owl kill and Eagle Bridge, Rensselaer county.

Drainage area.—512 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—August 13, 1910, to June 30, 1919. September 25, 1903, to December 31, 1908, at Buskirk, 4 miles below present station.

Gage.—Chain gage on left bank near the farm house of James Russell, about $1\frac{1}{2}$ miles above Eagle Bridge, installed September 4, 1918. Gage read by Mrs. J. E. Sherman and Dennis Mironowicz.

Discharge measurements.—Made from cable half mile below gage or by wading.

Channel and control.—Gravel; somewhat shifting.

Extremes of discharge.—Current year: Maximum stage recorded, 9.45 feet at 5 p. m., March 1; discharge, about 7,920 second-feet. Minimum stage recorded, 2.1 feet at 7:30 a. m., September 8; discharge, about 50 second-feet.

1910–1919: Maximum stage not recorded, as gage used prior to August 17, 1914, could not be reached at high stages. Minimum stage recorded, 6.1 feet at 5 p. m., September 14, 1913; discharge, practically zero.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Flow affected by storage on Walloomsac river and at Hoosick Falls about 2 miles above gage.

Accuracy.—Stage-discharge relation probably permanent during year; usually affected by ice during much of period, December to March, inclusive. Rating curve well defined between 75 and 7,000 second-feet. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good except for periods of low water, when semidaily gage heights may not indicate the true mean, and during periods when the stage-discharge relation is affected by ice. Results fair for the latter periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

GAGING OF STREAMS: HUDSON RIVER BASIN 283

Discharge measurements of HOOSIC RIVER NEAR EAGLE BRIDGE, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 4.....	E. D. Burchard.....	a 2.86	181
Sept. 4.....	E. D. Burchard.....	a 2.85	178
1919			
Apr. 11.....	M. H. Carson.....	5.69	2,160
July 4.....	O. W. Hartwell.....	2.66	146

a Observed on chain gage installed this day.

Daily gage height, in feet, of HOOSIC RIVER NEAR EAGLE BRIDGE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.35	2.76	3.3	4.15	4.15	3.75	4.5	4.0	7.6	a	4.0	4.2
2.....	3.3	2.66	3.15	3.9	4.0	3.6	6.8	3.9	5.6	a	4.0	4.1
3.....	3.4	2.54	2.89	3.8	3.75	3.6	5.7	4.05	4.7	a	4.4	3.8
4.....	2.96	2.42	2.88	3.75	3.85	3.6	5.3	4.0	4.8	a	4.2	3.8
5.....	3.25	2.38	2.68	3.9	4.0	3.7	5.0	3.85	4.8	a	7.0	3.6
6.....	3.1	2.71	2.74	4.45	3.85	3.55	a	3.8	5.3	a	5.4	3.5
7.....	2.68	2.55	2.56	4.7	3.9	3.45	a	3.95	4.9	a	5.2	3.5
8.....	3.2	2.66	2.25	4.1	3.7	3.6	a	3.75	4.6	a	5.1	3.5
9.....	3.1	2.81	2.48	4.05	3.75	4.2	a	3.4	4.6	a	5.0	3.4
10.....	3.1	2.93	2.54	3.9	3.65	3.6	a	3.75	6.2	a	5.2	3.55
11.....	3.35	2.74	2.58	3.7	3.6	3.4	a	3.7	5.3	5.7	5.6	3.6
12.....	3.25	2.72	2.38	3.55	3.7	3.6	a	3.75	4.8	6.6	5.5	3.6
13.....	3.35	2.71	2.62	3.7	3.7	3.5	a	3.7	4.6	6.8	5.7	3.3
14.....	2.99	2.70	2.40	3.9	3.6	4.4	a	3.6	4.2	5.8	5.2	3.2
15.....	3.55	2.65	2.28	3.8	3.45	7.0	a	3.7	4.1	5.5	4.8	3.25
16.....	3.0	2.64	2.55	3.6	3.5	5.9	a	3.25	4.2	5.2	4.6	3.4
17.....	3.2	2.60	2.64	3.5	3.3	5.2	a	3.55	4.7	5.5	4.9	3.3
18.....	3.3	2.31	2.65	3.5	4.1	4.8	a	3.75	5.9	5.4	6.5	3.65
19.....	3.2	2.37	2.90	3.45	5.8	4.4	a	3.5	5.9	5.1	5.3	3.6
20.....	3.05	2.66	2.96	3.2	5.3	4.3	a	3.35	5.4	4.9	5.3	3.6
21.....	2.88	2.70	3.8	4.05	4.9	4.2	a	3.35	5.9	4.8	5.1	3.05
22.....	2.93	2.64	3.95	4.0	4.9	4.15	a	3.3	a	4.6	6.8	3.4
23.....	2.82	2.44	3.5	3.8	4.7	6.3	a	3.0	a	4.4	6.5	3.2
24.....	2.82	2.30	3.2	3.55	4.4	5.3	5.5	3.1	a	4.5	5.7	3.05
25.....	2.66	2.45	3.4	3.4	4.4	6.2	4.6	3.15	a	4.5	5.5	3.3
26.....	2.72	2.52	5.3	3.6	4.3	5.7	4.4	4.7	a	4.2	5.5	2.85
27.....	2.70	2.63	6.5	3.35	3.9	5.1	4.45	3.75	a	4.2	5.2	3.0
28.....	2.41	2.50	4.9	3.65	3.7	4.9	4.2	3.7	a	4.4	4.8	3.7
29.....	2.55	2.60	4.2	3.4	3.95	4.4	4.2	.....	a	4.2	4.7	3.15
30.....	2.65	2.65	4.1	3.5	3.9	4.2	4.15	.....	a	4.0	4.4	2.92
31.....	2.65	2.55	.....	4.25	.....	4.35	4.0	.....	a	.....	4.2	.....

a No record.

Daily discharge, in second-feet, of HOOSIC RIVER NEAR EAGLE BRIDGE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	340	155	320	765	765	528	1,020	670	4,750	.....	670	800
2.....	320	132	268	610	670	450	3,590	610	2,100	.....	670	720
3.....	360	108	182	555	528	450	2,210	700	1,190	.....	940	555
4.....	208	88	185	528	582	450	1,770	670	1,280	.....	800	555
5.....	302	82	138	610	670	500	1,470	582	1,280	.....	3,870	480
6.....	250	142	150	980	582	428	1,400	555	1,770	.....	1,880	405
7.....	138	110	112	1,190	610	382	950	640	1,370	.....	1,670	405
8.....	285	132	65	730	500	450	800	528	1,100	.....	1,570	405
9.....	250	168	97	700	528	800	750	360	1,100	.....	1,470	360
10.....	250	199	108	610	475	450	750	528	2,810	.....	1,670	428
11.....	340	150	116	500	450	360	750	500	1,770	2,210	2,100	450
12.....	302	145	82	428	500	450	.....	528	1,280	3,320	1,990	450
13.....	340	142	124	500	500	405	.....	500	1,100	3,590	2,210	320
14.....	217	140	85	610	450	940	.....	450	800	2,330	1,670	285
15.....	428	130	68	555	382	3,870	.....	500	730	1,990	1,280	302
16.....	220	128	110	450	405	2,450	.....	302	800	1,670	1,100	360
17.....	285	120	128	405	320	1,670	.....	428	1,190	1,990	1,370	320
18.....	320	72	130	405	730	1,280	.....	528	2,450	1,880	3,190	475
19.....	285	80	190	382	2,330	940	.....	405	2,450	1,570	1,770	450
20.....	235	132	208	285	1,770	870	.....	340	1,880	1,370	1,770	450
21.....	185	140	555	700	1,370	800	750	340	2,450	1,280	1,570	235
22.....	199	128	640	670	1,370	765	800	320	2,400	1,100	3,590	360
23.....	170	91	405	555	1,190	2,930	1,100	220	2,200	940	3,190	285
24.....	170	70	285	428	940	1,770	1,990	250	2,200	1,020	2,210	235
25.....	132	92	360	360	940	2,810	1,100	268	2,200	1,020	1,990	320
26.....	145	104	1,770	450	870	2,210	940	1,190	2,200	800	1,990	178
27.....	140	126	3,190	340	610	1,570	980	528	2,400	800	1,670	220
28.....	86	100	1,370	475	500	1,370	800	500	2,800	940	1,280	500
29.....	110	120	800	360	640	940	800	.....	2,800	800	1,190	268
30.....	130	130	730	405	610	800	765	.....	2,400	670	940	196
31.....	130	110	.....	835	.....	905	670	.....	2,000	.....	800	.....
Mean...	235	121	432	560	760	1,130	1,050	498	1,910	1,710	1,740	392

NOTE.— Discharge, September 4 to 30, determined from gage heights observed on new chain gage. Discharge estimated, because of no record, January 6 to 23 and March 23 to April 10, from comparison with Schoon river at Riverbank and Sacandaga river at Hadley and study of discharge hydrograph.

Monthly discharge of HOOSIC RIVER NEAR EAGLE BRIDGE, for the year ended June 30, 1919

[Drainage area, 512 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OUT Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	428	86	235	0.459	0.53
August.....	199	70	121	0.236	0.27
September.....	3,190	65	432	0.844	0.94
October.....	1,190	285	560	1.09	1.26
November.....	2,330	320	760	1.48	1.65
December.....	3,870	360	1,130	2.21	2.55
January.....	3,590	670	1,050	2.05	2.36
February.....	1,190	220	498	0.973	1.01
March.....	4,750	730	1,910	3.73	4.30
April.....	3,590	670	1,710	3.34	3.73
May.....	3,870	670	1,740	3.40	3.92
June.....	800	178	392	0.766	0.85
The year.....	4,750	65	878	1.71	23.37

HOOSIC RIVER AT SCHAGHTICOKE

Location.—At the dam of the Schaghticoke power-plant of the Schenectady Power Company located at the highway bridge at Schaghticoke on the Hoosic river about $6\frac{1}{2}$ miles above its confluence with the Hudson river. The power-plant is about 1 mile below the dam and connected therewith by a canal and steel penstock.

Drainage area.—635 square miles.

Records available.—December 1, 1908, to June 30, 1919.

Gage.—Indicating water-surface above dam, consists of a float operating contacts, which by voltage drop indicates in the powerhouse the water-surface. Gage in the forebay at end of canal is a staff gage graduated to tenths.

Control.—Discharge estimates based on the flow over the dam and the flow through the wheels estimated from hourly readings reduced by curves furnished by water-wheel manufacturers, based upon tests after installation. There are 4 radial inward flow Francis type wheels manufactured by Pelton, each 5,000 hp.

Extremes of discharge.—Current year: Maximum mean daily discharge recorded, 7,598 second-feet on May 23. Minimum mean daily discharge recorded, 0 second-feet on July 4.

1908-1919: Maximum stage recorded, approximately 25,000 second-feet, February 6, 1909. Minimum stage recorded, 0 second-feet on a number of days, due to interruption of flow by plants farther upstream.

Regulation.—During low stages discharge appreciably affected by local storage at power-plants above station.

Coöperation.—Established and maintained by the Schenectady Power Company, discharge reduced and furnished by Mr. E. B. Doen, Superintendent, Schaghticoke, N. Y.

Daily discharge, in second-feet, of HOOSIC RIVER AT SCHAGHTICOKE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	339	111	428	819	723	470	656	549	3,550	1,768	400	2,479
2.....	274	64	220	662	546	467	867	362	2,072	1,528	869	509
3.....	310	74	185	504	487	542	737	469	1,435	1,596	874	1,395
4.....	0	70	89	504	562	514	464	500	1,248	1,794	890	834
5.....	244	31	57	568	662	443	414	475	1,401	2,549	2,400	563
6.....	337	50	100	1,200	640	286	1,149	414	1,681	3,060	1,403	480
7.....	121	115	93	1,031	795	409	1,161	372	1,271	3,028	1,420	444
8.....	281	127	94	743	587	428	1,154	442	1,214	2,628	1,026	193
9.....	174	127	127	663	466	674	1,135	185	1,649	2,510	1,783	506
10.....	268	173	40	604	474	421	875	307	1,960	2,149	1,595	450
11.....	335	62	71	506	539	421	843	231	1,606	2,001	3,062	400
12.....	335	150	57	451	317	466	425	293	1,200	3,750	2,171	326
13.....	384	115	34	553	468	462	705	323	1,610	2,460	2,876	292
14.....	243	104	70	613	413	1,284	853	417	1,045	1,398	2,614	318
15.....	451	78	10	466	298	1,347	815	419	879	1,943	1,667	100
16.....	236	55	104	646	370	1,609	689	243	692	1,549	1,270	327
17.....	245	115	34	317	324	1,233	611	307	1,477	1,980	3,255	270
18.....	300	55	132	330	1,384	1,021	733	269	1,999	1,568	6,610	270
19.....	407	80	173	369	2,091	1,023	566	169	2,284	1,278	6,036	175
20.....	349	70	225	347	1,503	800	700	267	1,961	1,211	4,850	202
21.....	196	69	723	722	1,217	819	495	285	2,110	1,185	3,506	130
22.....	141	80	510	532	1,066	783	646	217	2,080	735	4,811	187
23.....	207	70	289	502	965	901	1,064	196	1,757	850	7,598	241
24.....	164	46	219	403	552	950	2,080	368	1,583	867	6,650	209
25.....	183	100	430	459	762	474	731	450	1,274	721	6,465	186
26.....	130	57	1,750	478	473	736	920	1,263	1,176	596	5,601	185
27.....	118	81	1,332	266	621	491	1,117	472	1,145	633	5,017	418
28.....	138	70	870	514	487	551	889	774	2,954	588	2,854	498
29.....	3	115	518	400	717	350	790	.....	2,184	764	1,793	93
30.....	100	115	713	646	623	687	848	.....	2,129	718	1,689	204
31.....	138	266	.....	874	.....	754	680	.....	2,247	.....	3,115	.....
Mean...	230	93	323	570	703	702	832	394	1,705	1,646	3,102	429

Monthly discharge of HOOSIC RIVER AT SCHAGHTICOKE, for the year ended June 30, 1919

[Drainage area, 635 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	451	0	230	0.362	0.42
August.....	266	31	93	0.146	0.17
September.....	1,750	10	323	0.509	0.57
October.....	1,200	266	570	0.898	1.04
November.....	2,091	298	703	1.107	1.24
December.....	1,609	286	702	1.106	1.28
January.....	2,080	414	832	1.310	1.51
February.....	1,263	169	394	0.620	0.65
March.....	3,550	692	1,705	2.685	3.10
April.....	3,750	588	1,646	2.592	2.89
May.....	7,598	400	3,102	4.885	5.63
June.....	2,479	93	429	0.676	0.75
The year.....	7,598	0	894	1.408	19.25

MOHAWK RIVER

DESCRIPTION

Mohawk river, the largest tributary of the Hudson, rises in the sandy hills south of Boonville, in central New York, about 40 miles from the east end of Lake Ontario. Its uppermost tributaries are fed by large springs. The river receives also considerable water brought in from the adjacent Black river drainage basin for the supply of Black River and Erie canals. The Mohawk flows southward until it reaches the city of Rome, at which point it turns toward the east, flowing across the state in a course nearly east until it enters the Hudson at Cohoes opposite North Troy. Its total length is about 140 miles and its drainage area comprises 3,486 square miles.

The immediate valley of the Mohawk is broad and open, at many places a mile or two in width, and the flats which border the stream have a rich alluvial soil, finely adapted to the raising of grass, grains and broom corn. Back of the flats there is a rise, usually gradual, but in certain localities more or less abrupt, to hills which attain altitudes several hundred feet above the stream. The more elevated lands are covered with sandy and gravelly loam. Toward the mouth of the river the valley becomes contracted and the meadows disappear.

Above Rome the Mohawk flows through a deep gorge in shale rock. From Rome eastward to Little Falls the valley is deeply filled with alluvial deposits and the flood plains on either side become submerged during freshets, thus acting to some extent as storage reservoirs. At Little Falls the river cuts through a rocky gorge, whose walls rise precipitously 500 or 600 feet.

The Erie canal ran parallel to the Mohawk through most of its course below Rome and derived a part of its water-supply from the river. Feeder dams for purposes of diversion for the supply of the Black River and old Erie canals were located on the river at Delta, Rome, Little Falls, Rocky Rift and Rexford. A dam at Oriskany creek also diverted into the canal a portion of the flow of that tributary, as well as waters brought into the Mohawk basin from storage reservoirs located in the upper drainage basin of Chenango river near Hamilton. There was also a

diversion at the dam near the mouth of Schoharie creek, the largest tributary of the Mohawk.

The new Barge canal utilizes by canalization the greater portion of the river below Utica. The Barge canal leaves the north fork of the Mohawk river just above its junction with the Hudson river, where a low navigable surface at Elev. 15.2 is maintained by the Federal dam at Troy. The canal rises through five locks and reenters the river just above the new Crescent dam (dam No. 2), which is a curved concrete structure in two sections with an ogee crest totaling 1,486.2 feet at Elev. 184.0, final closure of which was made May 10, 1915, but by opening head-gates at the west end of the dam, the water-surface was kept below the crest until July 1, 1915, when gates were closed and first flow over the completed crest occurred. The head-gates were again opened from Oct. 11 to Dec. 4, 1915. This dam is about three-quarters of a mile above and is reached by the pool formed by the power dam of the Cohoes Company at Cohoes, the fixed crest of which was raised from an average elevation of 154.2 to about Elev. 157.0 in the summer of 1914. The pool formed by the Crescent dam extends about 10.2 miles upstream to the Vischer Ferry dam and submerges the old Dunsbach Ferry dam located about 4.6 miles upstream and which was partially removed during August, 1912.

The new Vischer Ferry dam (dam No. 3), final closure of which was made June 9, 1913, is a concrete structure with an ogee crest having a broken trace composed of three straight sections, of lengths, from south to north, of 735.2, 681.8 and 501.7, a total of 1,918.7 feet. The middle section is a low weir on an island cut down to Elev. 210.0 above the weir and somewhat lower below. This dam maintains a pool with a low navigable surface at crest elevation 211.0 about 10.9 miles in length and submerges the old State dam at Rexford about 4.3 miles upstream, which had a crest 675 feet long at Elev. 209.5.

Between Schenectady and St. Johnsville there are eight movable dams of the Boulé gate and bridge type. During the winter and during flood stages the gates and their supports are raised, leaving, except for either one or two piers, a channel entirely unobstructed and of an area practically equivalent to that existing at that point before the construction of the dam. The location of

these dams, clear span of openings, elevation of sill and pool, *i. e.* low water-surface to be maintained above dam during navigation season, and length of canalized pool above are as follows:

Scotia dam (No. 4) about three miles above the N. Y. C. R. R. bridge at Schenectady, openings 150-210-150 feet, sill Elev. 209.0, pool Elev. 225.0, 5 miles long.

Rotterdam dam (No. 5) about one and nine-tenths miles above the Boston & Maine bridge at Rotterdam Junction, openings 150-210-150 feet, sill Elev. 220.0, pool Elev. 240.0, 6 miles long.

Cranesville dam (No. 6) three and two-tenths miles below the Amsterdam-South Amsterdam highway bridge, openings 150-180-150 feet, sill Elev. 235.0, pool Elev. 255.0, 4.3 miles long.

Amsterdam dam (No. 7) one and one-tenth miles above the Amsterdam-South Amsterdam highway bridge, openings 180-210-180 feet, sill Elev. 247.0, pool Elev. 267.0, 4.3 miles long.

Tribes Hill dam (No. 8) just above the Tribes Hill-Fort Hunter highway bridge and just below the mouth of Schoharie creek, openings 240-240 feet, sill Elev. 262.0, pool Elev. 278.0, 9.6 miles long.

Yosts dam (No. 9) nine-tenths of a mile below the village of Yosts, openings 180-180 feet, sill Elev. 268.0, pool Elev. 286.0, 7.8 miles long.

Canajoharie dam (No. 10) about one-third mile above the Canajoharie-Palatine Bridge highway bridge, openings 210-210 feet, sill Elev. 276.0, pool Elev. 294.0, 3.4 miles long.

Fort Plain dam (No. 11) four-tenths of a mile above Fort Plain-Nelliston highway bridge, openings 210-210 feet, sill Elev. 284.0, pool Elev. 302.0, 6.6 miles long.

Although the above movable dams had been previously completed and operated to facilitate dredging operations, this portion of the canal was not opened to navigation until May, 1916.

From below new Barge canal lock No. 16, about one and four-tenths miles above St. Johnsville, to above the old Rocky Rift feeder dam the canal follows a land-line. Opposite lock No. 16, at the end of the river dredging, the natural bed of the stream is maintained by the Mindenville retention dam, the crest of which is 300 feet long and at Elev. 300.5, a foot and a half below

the low navigable surface above the Fort Plain dam. The old Rocky Rift feeder dam (No. 12) has been raised from the old fixed crest averaging about Elev. 319.35 to Elev. 322.5, by the addition of a movable crest, consisting of steel trestles and small Boulé gates with a new fixed crest, at Elev. 319.5. The canalized pool above this dam extends to about 3,000 feet below the lower dam at Little Falls, a distance of about 3.7 miles. Castle creek enters the land-line of the Barge canal just above, or west of the Indian Castle guard-gate and flows west through the canal, entering the Mohawk river above the Rocky Rift dam.

The three existing dams at Little Falls are unchanged, the upper, or State dam (No. 13) being used to maintain the canalized river pool at Elev. 363.0 and 3.2 miles in length to Jacksonburg, where the canal enters a land-line.

The canal reenters the river just above the Mohawk street bridge at Herkimer. Immediately below this bridge a new dam (No. 14) has been constructed to retain the canalized pool to the Frankfort retention dam, a distance of 4.6 miles, and that of the land-line from Frankfort to lock No. 19 at Sterling creek at a low navigable surface of Elev. 383.0. The Herkimer dam, a needle dam 126 feet long with a sill at Elev. 374.0, except for 10.5 feet, which is at Elev. 379.0, will be superseded by a new dam, just below, of the Boulé gate and bridge type, of the same span, now under construction.

Above Frankfort several bends in the river have been cut out to provide room for the land-line to Rome, and the existing bed of the stream is retained by the Frankfort retention dam, located just above the canal terminal spur at Frankfort and about 1,600 feet upstream from the highway bridge over the river on the Dyke road between Frankfort and North Frankfort. This dam is of concrete with an ogee crest, having a broken profile as follows: 41 feet 6 inches at Elev. 381.0, flanked by two sections each 36 feet 9 inches long, at Elev. 386.0. For the passage of flood flows there is a paved crest at Elev. 389.0, 433 feet long at the north end of the concrete structure. At Rome the Mohawk river enters the summit level of the Barge canal over a new retention dam, about 400 feet north of the canal, having a concrete ogee crest 225 feet long at Elev. 427.0, and is diverted eastward along the canal prism for 3.2 miles, leaving it over a concrete

spillway with an ogee crest 225 feet long at pool Elev. 420.0. There is also another and smaller spillway with paved crest 88 feet in length at Elev. 420, about three-quarters of a mile east of where the river enters the canal. The section of the summit level utilized for the river can be cut off from the remaining portions during higher flow periods by the closure of guard-gates at each end.

The water-supply for the Rome summit level of the new canal will to a large extent come from the Mohawk. A high dam has been constructed across the Mohawk at Delta, 6 miles north of Rome, for the purpose of creating a reservoir to store water for the canal. The capacity is 2,750,000,000 cubic feet. This supply will be supplemented by a reservoir of 3,445,000,000 cubic feet capacity on West Canada creek at Hinckley. Hinckley water will be passed down West Canada creek and diverted by a new dam on the site of the old Morgan dam at Trenton Falls through a feeder canal to Nine-Mile creek and thence to the Barge canal.

The principal tributaries of the Mohawk below the source are, successively, Oriskany, West Canada, East Canada and Schoharie creeks.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Lansingkill</i>				
Source to junction with West branch.....	29.41	.....	29.41	.....
<i>MOHAWK RIVER</i>				
Source of West branch to junction with East branch.....	19.25	19.25	.....	.....
Source of East branch to junction with West branch.....	15.16	34.41	.....	.....
Junction of East and West branches to and including first large creek to north.....	5.86	40.27	.....	.....
First creek below junction to and including second large creek to north.....	6.08	46.35	.....	.....
Second creek below junction to junction of Lansingkill, Hillside.....	3.40	49.75	49.75	79.16
Junction at Hillside to mouth of Stringer brook..	1.17	.....	.....	80.3
<i>Stringer Brook</i>				
Source to mouth.....	13.43	.....	13.43	93.76
<i>MOHAWK RIVER</i>				
Junction of Stringer brook to mouth of Big brook (Frenchville).....	3.02	.....	.....	96.78

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — Continued
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Big Brook</i>				
Source to mouth	23.86	.....	23.86	119.64
<i>MOHAWK RIVER</i>				
Junction of Big brook (Frenchville) to State feeder dam at Delta (now submerged)	16.25	.....	.....	135.89
State feeder dam at Delta to highway bridge below new Delta dam	11.97	.....	.....	147.86
Highway bridge below new Delta dam to Ridge Mills dam	7.74	.....	.....	155.60
Ridge Mills dam to Floyd Ave. bridge	2.60	.....	.....	158.19
Floyd Ave. bridge to State dam at Rome	2.55	.....	.....	160.74
State dam at Rome to mouth of Six-Mile creek ..	26.40	.....	.....	187.14
<i>Six-Mile Creek (Oneida Co.)</i>				
Source to mouth	14.94	.....	14.94	202.08
<i>MOHAWK RIVER</i>				
Mouth of Six-Mile creek to mouth of Nine-Mile creek	5.29	.....	.....	207.37
<i>Nine-Mile Creek</i>				
Source to South Trenton	19.62	.....	.....	.....
South Trenton to crossing of 700-foot contour ..	6.64	26.16	.....	.....
Crossing of 700-foot contour to first bridge above Holland Patent	2.49	28.65	.....	.....
First bridge above Holland Patent to first bridge below Holland Patent	12.71	41.36	.....	.....
First bridge below Holland Patent to Stittville ..	6.12	47.48	.....	.....
Stittville to first bridge below Stittville (Powell's bridge)	11.59	59.07	.....	.....
Powell's bridge to third bridge below Stittville ..	10.24	69.41	.....	.....
Third bridge below Stittville to mouth	0.79	70.20	70.20	277.57
<i>MOHAWK RIVER</i>				
Mouth of Nine-Mile creek to mouth of Oriskany creek	6.19	.....	.....	283.76
<i>Areas diverted from Chenango river basin *</i>				
Chenango river from source to junction with Eaton brook at Eaton	25.25	.....	.....	25.25
Eaton brook from source to Eaton reservoir dam ..	9.16	9.16	.....	.....
Eaton reservoir dam to junction with Chenango river at Eaton	6.69	15.85	15.85	41.10
Chenango river, junction Eaton brook to head of feeder canal	2.99	.....	.....	44.09
Bradley brook from source to Bradley reservoir dam	3.04	.....	.....	.....
Bradley reservoir dam to head of feeder canal	4.67	7.61	.....	.....
Kingsley brook from source to Kingsley reservoir dam	5.12	.....	.....	.....
Kingsley reservoir dam to junction with Bradley brook feeder canal	1.75	6.87	14.48	58.57
Header of feeder, Chenango river to junction of feeders, Woodman pond	2.04	.....	.....	60.61
Payne brook from source to Madison reservoir dam	8.73	.....	.....	.....
Madison reservoir dam to junction of feeders, Woodman pond	2.04	10.77	10.77	71.38
Junction of feeders, Woodman pond to junction with Leland pond outlet	3.26	.....	.....	74.64
Source, Leland creek to canal reservoir dam	6.74	.....	.....	81.38
Junction with Leland pond outlet to natural watershed limits	6.53	.....	.....	87.91

* Not included in totals for Mohawk river areas.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — *Continued*
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Oriskany Creek</i>				
Source of Oriskany creek to bridge at Solsville...	7.84	.....	.....	.....
Solsville to Oriskany Mills.....	13.27	21.11	.....	.....
Oriskany Mills to junction with Big creek, Oneida county (Deansboro).....	16.54	37.65	.....	.....
Source of Big creek to junction with Oriskany creek (Deansboro).....	20.32	57.97	.....	.....
Junction with Big creek to Farmers Mills.....	14.09	72.06	.....	.....
Farmers Mills to Clinton.....	11.11	83.17	.....	.....
Clinton to Kirkland.....	4.73	87.90	.....	.....
Kirkland to dam above Clark Mills.....	5.76	93.66	.....	.....
Dam above Clark Mills to Walesville.....	9.92	103.58	.....	.....
Walesville to Colemans.....	36.99	140.57	.....	.....
Colemans to State dam above Oriskany.....	5.47	146.04	.....	.....
State dam above Oriskany to mouth of Oriskany creek.....	0.78	146.82	146.82	430.58
<i>MOHAWK RIVER</i>				
Mouth of Oriskany creek to mouth of Sauquoit creek.....	15.68	.....	.....	446.26
<i>Sauquoit Creek</i>				
Source of Sauquoit creek to Cassville.....	7.17	.....	.....	.....
Cassville to dam at Clayville.....	4.71	11.88	.....	.....
Dam at Clayville to dam at Sauquoit.....	12.54	24.42	.....	.....
Dam at Sauquoit to dam above Chadwick.....	4.28	28.70	.....	.....
Dam above Chadwick to 700-foot contour at Willowvale.....	3.72	32.42	.....	.....
700-foot contour at Willowvale to dam at Washington Mills.....	11.37	43.79	.....	.....
Dam at Washington Mills to dam above New Hartford.....	2.92	46.71	.....	.....
Dam above New Hartford to dam at Capron.....	1.52	48.23	.....	.....
Dam at Capron to dam below Capron.....	2.20	50.43	.....	.....
Dam below Capron to upper dam at New York Mills.....	0.49	50.92	.....	.....
Upper dam at New York Mills to mouth of Sauquoit creek.....	14.58	65.50	65.50	511.76
<i>MOHAWK RIVER</i>				
Mouth of Sauquoit creek to Black River R. R. bridge at Utica.....	13.09	.....	.....	524.85
Black River R. R. bridge at Utica to mouth of Reels creek.....	2.70	.....	.....	527.55
<i>Reels Creek</i>				
Source to mouth.....	9.69	.....	9.69	537.24
<i>Ballou Creek</i>				
Source to mouth.....	4.57	.....	4.57	541.81
<i>MOHAWK RIVER</i>				
Mouth of Ballou creek to mouth of Starch Factory creek.....	1.99	.....	.....	543.80
<i>Starch Factory Creek</i>				
Source to mouth.....	7.22	.....	.....	551.02
<i>MOHAWK RIVER</i>				
Mouth of Starch Factory creek to mouth of Sterling creek.....	30.93	.....	.....	581.95
<i>Sterling Creek</i>				
Source to mouth.....	19.94	.....	.....	601.89
<i>MOHAWK RIVER</i>				
Mouth of Sterling creek to mouth of Moyer creek.....	14.85	.....	.....	616.74

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — Continued
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Moyer Creek</i>				
Source to mouth.....	21.66	.....	.....	638.40
MOHAWK RIVER				
Mouth of Moyer creek to mouth of Steels creek..	7.30	.....	.....	645.70
<i>Steels Creek</i>				
Source to mouth.....	29.54	.....	.....	675.24
MOHAWK RIVER				
Mouth of Steels creek to Mohawk-Herkimer road bridge.....	33.07	.....	.....	708.31
Mohawk-Herkimer road bridge to mouth of West Canada creek.....	7.51	.....	.....	715.82
<i>West Canada Creek *</i>				
Source to mouth.....	583.64	.....	.....	1,299.46
MOHAWK RIVER				
Mouth of West Canada creek to State dam at Little Falls.....	26.07	.....	.....	1,325.53
State dam at Little Falls to Gilberts dam.....	4.20	.....	.....	1,329.73
Gilberts dam to Rocky Rift feeder dam.....	11.82	.....	.....	1,341.55
<i>Crum Creek</i>				
Source to mouth.....	11.40	.....	.....	1,352.95
MOHAWK RIVER				
Mouth of Crum creek (feeder dam) to mouth of Nowadaga creek.....	0.27	.....	.....	1,353.22
<i>Nowadaga Creek</i>				
Source to mouth.....	32.43	.....	.....	1,385.65
MOHAWK RIVER				
Mouth of Nowadaga creek to mouth of East Canada creek.....	4.65	.....	.....	1,390.30
<i>East Canada Creek *</i>				
Source to mouth.....	a 281.81	.....	.....	a 1,672.11
MOHAWK RIVER				
Mouth of East Canada creek to mouth of East Crum creek.....	0.59	.....	.....	a 1,672.70
<i>East Crum Creek</i>				
Source to mouth.....	15.55	.....	.....	a 1,688.25
MOHAWK RIVER				
Mouth of East Crum creek to mouth of Timmerman creek.....	3.31	.....	.....	a 1,691.56
<i>Timmerman Creek</i>				
Source to mouth.....	16.38	.....	.....	a 1,707.94
MOHAWK RIVER				
Mouth of Timmerman creek to mouth of Zimmerman creek.....	0.52	.....	.....	a 1,708.46
<i>Zimmerman Creek</i>				
Source to mouth.....	14.63	.....	.....	a 1,723.09
MOHAWK RIVER				
Mouth of Zimmerman creek to St. Johnsville bridge.....	0.54	.....	.....	a 1,723.63
St. Johnsville bridge to mouth of Garoga creek.....	12.05	.....	.....	a 1,735.68

* For subareas, see separate table following. a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 323 and 325.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — Continued
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Garoga Creek</i>				
Source of Garoga creek to foot of East Garoga lake.....	10.44	.....	.....	.....
Foot of East Garoga lake to foot of pond, Newkirk Mills.....	3.18	13.62	.....	.....
Foot of pond, Newkirk Mills, to junction with Peck lake outlet.....	9.11	22.73	22.73	.....
Source to Woodworth lake to foot of Peck lake.....	16.29	.....	.....	.....
Foot of Peck lake to junction with Garoga creek.....	4.52	20.81	48.54	.....
Junction with Peck lake outlet to Rockwood.....	7.20	.....	50.74	.....
Rockwood to Garoga.....	2.19	.....	52.93	.....
Garoga to mouth of Sprite creek.....	4.99	.....	57.92	.....
Source of Sprite creek to mouth.....	14.13	.....	72.05	.....
Mouth of Spr to creek to fourth highway bridge above mouth.....	13.19	.....	85.24	.....
Fourth highway bridge above mouth to second highway bridge above mouth.....	7.78	.....	93.02	.....
Second highway bridge above mouth to first highway bridge above mouth.....	1.17	.....	94.19	.....
First highway bridge above mouth to mouth of Garoga creek.....	0.51	.....	94.70	a 1,830.28
<i>MOHAWK RIVER</i>				
Mouth of Garoga creek to Fort Plain.....	12.70	.....	.....	a 1,843.08
Fort Plain to Canajoharie.....	67.92	.....	.....	a 1,911.00
<i>Canajoharie Creek</i>				
Source to mouth.....	69.22	.....	69.22	a 1,980.22
<i>MOHAWK RIVER</i>				
Canajoharie to Sprakers.....	9.94	.....	.....	a 1,990.16
<i>Flat Creek</i>				
Source to mouth.....	49.11	.....	49.11	a 2,039.27
<i>MOHAWK RIVER</i>				
Sprakers to mouth of Yatesville creek.....	17.56	.....	.....	a 2,056.83
<i>Yatesville Creek</i>				
Source to mouth.....	12.71	.....	12.71	a 2,069.54
<i>MOHAWK RIVER</i>				
Mouth of Yatesville creek to mouth of Cayadutta creek.....	24.48	.....	.....	a 2,094.02
<i>Cayadutta Creek</i>				
Source of Cayadutta creek to Johnstown (Main street bridge).....	35.16	.....	.....	.....
Johnstown (Main street bridge) to dam above Sammons ville.....	2.84	38.00	.....	.....
Dam above Sammons ville to dam at Sammons ville.....	3.53	41.53	.....	.....
Dam at Sammons ville to dam two miles below Sammons ville.....	16.44	57.97	.....	.....
Dam below Sammons ville to mouth of Cayadutta creek.....	5.06	63.03	63.03	a 2,157.05
<i>MOHAWK RIVER</i>				
Mouth of Cayadutta creek to Fultonville bridge..	0.68	.....	.....	a 2,157.73
Fultonville bridge to mouth of Schoharie creek..	47.39	.....	.....	a 2,205.12
<i>Schoharie Creek *</i>				
Source to mouth.....	b 929.88	.....	.....	b 3,135.00

* For subareas, see table following. a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325. b These areas have been revised as the result of a joint determination of drainage areas of Schoharie creek, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer, and are also corrected for the error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — *Concluded*

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
MOHAWK RIVER				
Mouth of Schoharie creek to mouth of Chuctanunda creek (Amsterdam)	31.54	.....	.....	b 3,195.84
<i>South Chuctanunda Creek</i>				
Source to Minaville	22.62	22.62	.....	.....
Minaville to mouth	10.41	33.03	33.03	b 3,195.87
<i>North Chuctanunda Creek</i>				
Source to dam, Amsterdam reservoir	8.76	8.76	.....	.....
Dam, Amsterdam reservoir to Hagaman	20.77	29.53	.....	.....
Hagaman to Rockton	4.11	33.64	.....	.....
Rockton to mouth	5.58	39.22	39.22	b 3,238.79
MOHAWK RIVER				
Amsterdam to Hoffman Ferry	43.59	.....	.....	b 3,282.38
Hoffman Ferry to Scotia bridge	52.44	.....	.....	b 3,334.82
Scotia bridge to mouth of Alplaus kill	24.37	.....	.....	b 3,359.19
<i>Alplaus Kill</i>				
Source to mouth	55.80	.....	55.80	b 3,414.99
MOHAWK RIVER				
Mouth of Alplaus kill to Vischer Ferry dam	12.21	.....	.....	b 3,427.20
Vischer Ferry dam to Crescent dam	68.13	.....	.....	b 3,493.33
Crescent dam to Cohoes Co.'s dam	0.61	.....	.....	b 3,493.94
Cohoes Co.'s dam to mouth of Mohawk river	12.68	.....	.....	b 3,506.63

b These areas have been revised as the result of a joint determination of drainage areas of Schoharie creek, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer, and are also corrected for the error of 0.2 noted in Report of State Engineer and Surveyor for 1918, Vol. II, pages 322 and 325.

Drainage areas of WEST CANADA CREEK

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
WEST CANADA CREEK				
Source to outlet of Mud lake	18.05	.....	.....	18.05
Outlet of Mud lake to Swanson dam	28.77	.....	.....	46.82
Swanson dam to Honnedaga brook	46.82	.....	.....	93.64
<i>Honnedaga Brook</i>				
Honnedaga lake above outlet	5.40	.....	.....	.....
Lake to mouth	11.90	.....	17.30	110.94
WEST CANADA CREEK				
Honnedaga brook to South branch	30.46	.....	.....	141.40
<i>South Branch, West Canada Creek</i>				
Source to Mountain House	34.40	.....	.....	.....
Mountain House to mouth	19.25	.....	53.65	195.05

Drainage areas of WEST CANADA CREEK — *Continued*
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
WEST CANADA CREEK				
South branch to Four-Mile brook (Wilmurt bridge).....	2.58	.....	.....	197.63
Four-Mile Brook				
Source to mouth.....	.....	.....	26.17	223.80
WEST CANADA CREEK				
Four-Mile brook to Black creek.....	36.92	.....	.....	260.72
Black Creek				
Source through Hall Vly.....	8.40	.....	.....	.....
Hall Vly to Bennett's mill (first bridge above Gray).....	16.30	.....	24.70	.....
Bennett's mill to Gray.....	4.50	.....	29.20	.....
Gray to North branch (first bridge below Gray).....	3.00	.....	32.20	.....
North Branch, Black Creek				
Source to Bull Hill road (contour 1,520).....	6.80	.....	.....	.....
Bull Hill road to Mill creek.....	4.00	10.80	.....	.....
Mill creek:				
Source through Cranberry lake and swamp.....	11.00	.....	.....	.....
Foot of Cranberry swamp to mouth.....	6.20	17.20	.....	.....
Total, North branch, Black creek, to Mill creek, inclusive.....		28.00		
North Branch, Black Creek				
Mill creek to mouth.....	0.85	28.85	61.05	.....
Black Creek				
North branch to Mounts creek.....	0.17	.....	61.22	.....
Mounts Creek				
Source to Gray-Wilmurt road (Radley).....	13.25	.....	.....	.....
Gray-Wilmurt road to mouth.....	2.10	15.35	76.57	.....
Black Creek				
Mounts creek to second bridge below Gray.....	1.55	.....	78.12	.....
Second bridge to third bridge below Gray.....	5.65	.....	83.77	.....
Third bridge to fourth bridge below Gray.....	12.35	.....	96.12	.....
Fourth bridge to Pardeville bridge.....	4.00	.....	100.12	.....
Pardeville bridge to Grant c.....	1.95	.....	102.07	.....
Grant to West Canada creek c.....	1.15	.....	103.22	363.94
WEST CANADA CREEK				
Black creek to Twin Rock bridge c.....	0.50	.....	.....	364.44
Twin Rock bridge to Hinckley dam c.....	8.50	.....	.....	372.94
Hinckley dam to Prospect.....	2.00	.....	.....	374.94
Prospect to Trenton Falls.....	0.90	.....	.....	375.84
Trenton Falls to Steuben creek.....	6.20	.....	.....	382.04
Steuben Creek				
Source to mouth.....	.....	.....	52.30	434.34
WEST CANADA CREEK				
Steuben creek to Poland (first bridge below).....	25.80	.....	.....	470.14
Poland to Newport.....	10.00	.....	.....	480.14
Newport to Middleville.....	47.20	.....	.....	527.34
Middleville to East bridge.....	47.50	.....	.....	574.84
East bridge to mouth.....	8.80	.....	.....	583.64

c Creek drowned out by reservoir.

Drainage areas of EAST CANADA CREEK
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
EAST CANADA CREEK				
Above Oregon	40.13	.....	.....	40.13
Oregon to junction with North creek.....	10.42	.....	.....	50.55
North Creek				
Source to junction with East Canada creek.....	18.60	.....	18.60	69.15
EAST CANADA CREEK				
Junction with North creek to junction with Trammel creek.....	8.63	.....	.....	77.78
Trammel Creek				
Source to junction with East Canada creek.....	12.04	.....	.....	89.82
EAST CANADA CREEK				
Junction with Trammel creek to junction with Ayers creek (Stratford).....	0.20	.....	.....	90.02
Ayers Creek				
Source to junction with East Canada creek.....	13.63	.....	.....	103.65
EAST CANADA CREEK				
Junction with Ayers creek (Stratford) to Emmonsburg.....	8.05	.....	.....	111.70
Emmonsburg to junction with Big Sprite creek...	15.68	.....	.....	127.38
Big Sprite Creek				
Source to Stewart landing.....	40.90	.....	.....	.....
Stewart landing to junction with East Canada creek.....	7.87	.....	48.77	176.15
EAST CANADA CREEK				
Junction with Big Sprite creek to junction with Middle Sprite creek.....	3.70	.....	.....	179.85
Middle Sprite Creek				
Source to junction with East Canada creek.....	22.65	.....	.....	202.50
EAST CANADA CREEK				
Junction with Middle Sprite creek to junction with Spruce creek.....	0.20	.....	.....	202.70
Spruce Creek				
Source to dam at Diamond Hill.....	36.20	36.20	.....	a 253.18
Dam at Diamond Hill to Salisbury.....	13.08	49.28	.....	.....
Salisbury to junction with East Canada creek...	1.20	.....	50.48	.....
EAST CANADA CREEK				
Junction with Spruce creek to lower bridge, Dolgeville.....	0.60	.....	.....	a 253.78
Lower bridge, Dolgeville, to High falls.....	3.64	.....	.....	a 257.42
High falls to junction with Gillett creek.....	0.84	.....	.....	a 258.26
Gillett Creek				
Source to junction with East Canada creek.....	10.92	.....	.....	a 269.18
EAST CANADA CREEK				
Junction with Gillett creek to Ingham Mills.....	8.73	.....	.....	a 277.91
Ingham Mills to Beardslee Falls.....	3.60	.....	.....	a 281.51
Beardslee Falls to mouth.....	0.30	.....	.....	a 281.81

a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

GAGING OF STREAMS: MOHAWK RIVER BASIN 299

Drainage areas of SCHOHARIE CREEK* (From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
Source to Pratt Rocks, about 1½ miles above Prattville highway bridge	225.89	225.89
Pratt Rocks to Prattville gage at highway bridge, Prattville.....	10.23	236.12
Prattville gage to Devasego Falls, at falls.....	6.84	242.96
Devasego Falls to Gilboa, at power dam.....	70.78	313.71
Gilboa to North Blenheim, at old dam.....	88.85	402.56
North Blenheim to Middleburg, at highway bridge.....	129.01	531.57
Middleburg to Schoharie Junction, at D. & H. R. R. bridge.....	284.13	815.70
Schoharie Junction to Sloansville, at highway bridge.....	16.85	832.55
Sloansville to Esperance, at highway bridge.....	43.77	876.32
Esperance to Burtonville, at power dam, about ½ mile above highway bridge.....	10.87	886.69
Burtonville to Florida, just below fordway.....	19.43	906.12
Florida to Wellsville, about ½ mile above highway bridge.....	7.95	914.07
Wellsville to Mill Point, about ½ mile below highway bridge.....	6.86	920.43
Mill Point to Fort Hunter, at Fort Hunter feeder dam.....	9.45	929.88

* This table is the result of a joint determination of drainage areas of Schoharie creek, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

DELTA RESERVOIR

Gage No. 155

This station, established April, 1913, is located at the dam of the Delta reservoir on the Mohawk river. The gage is a concrete staff on the substructure of the gate-house. This station indicates the surface of the Delta reservoir, constructed in connection with the Barge canal work to supply the Rome summit level. It is read twice daily—at 9 A. M. and 4 P. M.—to tenths. The dam is a concrete structure with an ogee crest 300 feet long at elevation 550.0. There are four 60-inch pipes to pass water downstream and a 30-inch pipe line to supply water to the Black River canal. The reservoir at crest level has an area of about $4\frac{1}{3}$ square miles and a capacity of 2,750,000,000 cubic feet.

Daily elevation of water-surface (B. C. datum) of DELTA RESERVOIR AT DELTA DAM, for the year ended June 30, 1919. William Masner and Michael E. McCurn, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	540.45	536.15	530.6	535.55	541.85	544.7	539.55	542.2	539.2	549.0	550.15	549.9
2.....	540.5	535.95	530.55	535.5	542.1	544.7	540.9	542.1	539.7	548.4	550.95	549.75
3.....	540.4	535.75	530.35	535.5	542.5	544.7	541.2	542.0	540.0	547.85	550.75	549.55
4.....	540.3	535.55	530.05	535.6	542.65	544.15	541.3	541.85	540.05	548.05	550.6	549.35
5.....	540.15	535.35	529.9	535.5	542.85	543.15	541.4	541.7	540.5	548.35	550.5	549.25
6.....	540.0	535.2	530.0	535.75	542.9	542.2	541.4	541.55	540.7	548.65	550.45	549.1
7.....	539.85	535.05	529.95	536.35	542.9	541.25	541.4	541.35	540.7	548.95	550.4	549.0
8.....	539.65	534.85	529.75	536.5	542.9	540.25	541.4	541.2	540.85	549.15	550.4	548.9
9.....	539.5	534.95	529.55	536.4	542.8	539.4	541.4	541.1	541.05	549.6	550.3	548.8
10.....	539.4	534.9	529.35	536.3	542.9	538.55	541.3	540.95	542.3	550.0	550.3	548.7
11.....	539.3	534.75	529.15	536.25	543.0	537.65	541.3	540.75	542.85	550.6	550.65	548.6
12.....	539.25	534.65	529.0	536.1	543.0	536.55	541.2	540.5	543.0	551.25	550.7	548.5
13.....	539.1	534.45	529.35	536.05	543.0	535.45	541.1	540.35	543.35	550.85	550.65	548.4
14.....	539.0	534.25	529.8	536.0	542.9	535.0	541.1	540.2	543.5	550.65	550.55	548.3
15.....	538.9	534.05	529.8	535.95	542.85	536.2	551.1	540.6	543.65	550.45	550.4	548.2
16.....	538.8	533.8	529.7	535.9	542.8	536.05	541.0	540.70	543.8	550.25	550.3	548.1
17.....	538.65	533.55	530.3	535.75	542.7	535.2	541.0	540.55	544.15	550.2	550.95	548.0
18.....	538.6	533.35	532.05	535.6	543.1	534.15	540.85	540.4	545.45	550.1	551.3	548.0
19.....	538.5	533.1	532.1	535.5	543.6	532.05	540.75	540.3	547.65	550.0	550.95	547.9
20.....	538.35	532.85	533.6	535.45	544.0	531.95	540.6	540.15	548.25	549.85	550.65	547.9
21.....	538.15	532.65	534.25	537.0	544.1	531.9	540.45	540.05	549.3	549.65	550.6	547.8
22.....	537.95	532.45	534.4	537.3	544.2	532.1	540.4	539.85	550.2	549.45	550.5	547.7
23.....	537.8	532.25	534.5	537.4	544.2	535.1	540.3	539.7	550.3	549.3	550.6	547.6
24.....	537.65	532.05	534.65	537.4	544.15	535.95	541.7	539.6	550.4	549.45	550.7	547.5
25.....	537.45	531.85	534.95	537.3	544.1	538.05	542.15	539.35	550.4	549.75	550.7	547.4
26.....	537.35	531.65	535.0	538.45	544.0	539.1	542.3	539.3	550.25	549.85	550.65	547.4
27.....	537.15	531.45	535.25	539.45	544.0	539.45	542.4	539.15	550.2	549.95	550.55	547.5
28.....	536.95	531.25	535.5	539.6	544.0	539.6	542.5	539.1	550.5	550.05	550.4	547.6
29.....	536.75	531.05	535.6	539.75	544.35	539.6	542.5	.....	550.15	550.15	550.35	547.7
30.....	536.55	530.85	535.65	539.95	544.6	539.5	542.45	.....	549.85	550.25	550.45	547.7
31.....	536.35	530.6	.....	541.3	.....	539.5	542.35	.....	549.5	.....	550.1	.....

MOHAWK RIVER ABOVE STATE DAM, ROME

Gage No. 37

This station, established May 3, 1904, is located about 100 feet above the old State dam at Rome. The gage, originally No. 154 but now recorded as No. 37, is a staff secured to an elm tree at the head of the Erie canal feeder and gives the elevation of water-surface above the dam. It is read once daily—at 7 or 8 A. M.—to tenths, the hundredths in the table being due to the datum of the gage. The gage bench-mark is a copper plug on the lower side of the west wing of the tow-path side of the Mohawk feeder and is at elevation 434.295 (B. C. datum).

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE STATE DAM AT ROME, for the year ended June 30, 1919. John Phillips, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	431.93	431.83	431.83	431.93	432.13	431.93	431.93	431.93	432.03	432.93	431.83	432.03
2.....	431.83	431.83	431.83	432.03	432.13	431.93	432.03	431.93	431.93	432.43	432.03	432.03
3.....	431.83	431.93	431.93	432.03	432.03	431.93	432.13	432.03	431.93	432.43	432.33	432.03
4.....	431.83	431.83	431.93	431.93	432.03	431.93	432.13	431.93	431.93	432.43	432.33	432.03
5.....	431.83	431.93	431.83	431.93	432.03	431.93	432.03	431.93	431.93	432.53	432.33	431.93
6.....	431.83	431.83	431.93	432.03	431.93	432.03	432.03	432.03	431.93	432.43	432.13	432.03
7.....	431.83	431.83	431.83	431.93	432.03	431.93	431.93	432.03	431.93	432.53	431.93	431.93
8.....	431.83	431.93	431.93	431.93	431.93	431.93	431.93	432.03	431.93	432.33	431.83	432.03
9.....	431.83	431.93	431.83	431.93	431.93	432.03	431.93	431.93	431.83	432.13	431.83	432.03
10.....	431.93	431.93	431.83	431.83	432.03	432.33	431.83	431.93	431.93	431.93	431.93	431.93
11.....	431.93	431.83	431.93	431.93	432.03	432.63	431.83	431.93	431.93	432.13	432.13	432.03
12.....	431.93	431.83	432.03	431.93	432.03	432.63	431.83	432.03	431.93	433.73	432.13	432.03
13.....	431.83	431.83	432.03	431.93	431.93	432.63	431.83	431.93	431.93	432.93	432.13	431.93
14.....	431.93	431.93	431.93	431.93	432.03	432.63	431.83	432.03	431.83	432.73	432.13	431.93
15.....	431.93	431.83	431.93	432.03	431.93	432.73	431.83	432.03	431.83	432.33	432.13	432.03
16.....	431.93	431.83	431.93	431.93	431.93	432.73	431.93	431.93	431.93	432.33	432.53	432.03
17.....	431.93	431.93	431.93	431.93	432.03	432.73	431.93	431.93	431.93	432.33	432.93	432.03
18.....	431.93	431.83	432.03	432.03	432.03	432.63	432.03	431.93	431.93	432.33	433.43	431.93
19.....	431.93	431.83	431.93	431.93	432.03	432.63	432.03	431.93	431.83	432.23	432.93	432.03
20.....	431.93	431.93	431.93	432.03	432.03	432.63	432.03	431.93	431.83	432.23	432.43	432.03
21.....	431.83	431.83	432.03	432.03	432.03	432.23	431.93	431.93	431.83	432.33	432.53	432.13
22.....	431.83	431.83	431.93	432.03	431.93	431.93	431.93	431.93	431.83	432.23	432.43	431.83
23.....	431.83	431.93	431.93	432.03	432.03	432.03	431.93	431.83	431.93	432.23	432.43	431.83
24.....	431.93	431.83	432.03	432.03	432.03	432.03	432.03	431.83	431.83	432.23	432.33	431.83
25.....	431.83	431.83	431.93	431.93	432.03	431.93	432.03	431.93	431.83	432.23	432.33	431.93
26.....	431.83	431.83	431.93	432.03	431.93	431.93	431.93	431.93	431.83	432.13	432.43	432.03
27.....	431.83	431.83	432.03	432.03	431.93	432.03	431.93	431.83	431.93	432.03	432.43	431.93
28.....	431.83	431.93	431.93	431.93	432.03	432.03	431.93	431.93	431.93	432.13	431.83	432.23
29.....	431.83	431.93	431.93	432.03	432.03	431.93	431.93	.....	432.13	431.83	432.23	431.93
30.....	431.93	431.93	431.93	432.03	432.03	431.83	432.03	.....	432.23	431.83	432.13	431.93
31.....	431.83	431.93	.....	432.03	.....	431.83	431.93	.....	432.23	.....	432.23	.....

MOHAWK RIVER ABOVE RETENTION DAM, ROME

Gage No. 154

This station, replacing old No. 153 (below State dam, discontinued December 31, 1917) was established December 15, 1916, above the new State retention dam at Rome. A standard slope gage was erected on the right bank of the river about 150 feet above the retention dam, and has a range of 5 feet, between elevations 426.0 and 431.0 (B. C. datum). A reference point was also established on the right abutment and readings are taken by measuring down from this point. Records began February 1, 1918. The reference point is at elevation 434.0.

Readings are taken once daily—at 7 or 8 A. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE RETENTION DAM AT ROME, for the year ended June 30, 1919. John Phillips, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	427.6	427.6	427.5	427.4	427.7	427.5	427.5	427.6	427.5	427.8	427.4	427.6
2.....	427.6	427.6	427.5	427.5	427.7	427.5	427.6	427.5	427.5	427.8	427.6	427.6
3.....	427.6	427.5	427.6	427.5	427.6	427.5	427.6	427.6	427.4	427.9	427.8	427.6
4.....	427.6	427.5	427.6	427.6	427.6	427.4	427.6	427.5	427.5	427.8	427.7	427.6
5.....	427.5	427.6	427.5	427.5	427.6	427.5	427.5	427.5	427.4	427.9	427.7	427.5
6.....	427.6	427.5	427.6	427.6	427.5	427.5	427.5	427.5	427.4	427.8	427.6	427.6
7.....	427.5	427.4	427.5	427.5	427.6	427.5	427.4	427.5	427.4	427.8	427.5	427.5
8.....	427.6	427.5	427.5	427.6	427.5	427.5	427.5	427.6	427.4	427.6	427.4	427.6
9.....	427.6	427.5	427.5	427.6	427.6	427.6	427.5	427.5	427.3	427.5	427.4	427.6
10.....	427.7	427.6	427.5	427.4	427.5	427.8	427.4	427.5	427.3	427.5	427.5	427.5
11.....	427.6	427.5	427.4	427.5	427.6	428.1	427.4	427.6	427.4	427.5	427.7	427.6
12.....	427.6	427.4	427.5	427.6	427.6	428.1	427.5	427.6	427.4	428.7	427.7	427.6
13.....	427.5	427.4	427.6	427.5	427.5	428.1	427.4	427.5	427.5	428.4	427.7	427.5
14.....	427.6	427.3	427.5	427.6	427.6	428.1	427.5	427.5	427.5	428.3	427.7	427.5
15.....	427.6	427.4	427.4	427.6	427.6	428.2	427.4	427.6	427.4	427.6	427.7	427.6
16.....	427.6	427.5	427.5	427.6	427.6	428.3	427.6	427.5	427.5	427.7	428.1	427.7
17.....	427.5	427.5	427.6	427.5	427.6	428.3	427.6	427.4	427.5	427.8	428.6	427.6
18.....	427.6	427.4	427.6	427.6	427.7	428.1	427.6	427.4	427.5	427.7	428.8	427.5
19.....	427.6	427.5	427.5	427.5	427.6	428.1	427.6	427.4	427.5	427.6	428.6	427.6
20.....	427.6	427.6	427.6	427.5	427.6	428.2	427.6	427.4	427.5	427.7	428.0	427.6
21.....	427.5	427.5	427.6	427.6	427.5	427.8	427.5	427.4	427.4	427.7	428.0	427.7
22.....	427.4	427.5	427.5	427.6	427.5	427.5	427.5	427.3	427.4	427.6	428.0	427.4
23.....	427.5	427.6	427.4	427.6	427.6	427.5	427.5	427.3	427.5	427.7	428.0	427.5
24.....	427.6	427.5	427.5	427.6	427.6	427.6	427.6	427.6	427.4	427.7	427.9	427.5
25.....	427.5	427.4	427.4	427.5	427.6	427.5	427.6	427.4	427.4	427.7	427.9	427.5
26.....	427.5	427.5	427.4	427.6	427.5	427.5	427.5	427.5	427.4	427.7	428.0	427.6
27.....	427.5	427.5	427.5	427.6	427.5	427.6	427.6	427.4	427.5	427.6	428.0	427.5
28.....	427.5	427.6	427.4	427.5	427.6	427.6	427.5	427.4	427.7	427.4	427.8	427.4
29.....	427.5	427.6	427.4	427.6	427.6	427.6	427.6	.....	427.7	427.4	427.8	427.3
30.....	427.5	427.6	427.5	427.6	427.6	427.5	427.6	.....	427.6	427.4	427.7	427.3
31.....	427.6	427.6	.....	427.6	.....	427.4	427.6	.....	427.6	.....	427.6	.....

MOHAWK RIVER BELOW RETENTION DAM, ROME

Gage No. 153

This station, established February 1, 1918, is located on the canalized Mohawk river about 300 feet below the retention dam and east of the guard-gate. A reference point is established at the east end of the north abutment and readings are made by measuring down from this point. The reference point is at elevation 432.0 (B. C. datum).

Readings are taken once daily to tenths:

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER BELOW RETENTION DAM AT ROME, for the year ended June 30, 1919. John Phillips, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	420.6	420.3	420.3	420.2	420.4	420.1	420.2	420.4	420.3	420.6	420.4	420.1
2.....	420.6	420.2	420.4	420.3	420.4	420.1	420.4	420.4	420.4	420.6	420.5	420.1
3.....	420.6	420.3	420.3	420.3	420.3	420.1	420.6	420.4	420.4	420.5	420.5	420.2
4.....	420.6	420.2	420.2	420.3	420.4	420.2	420.6	420.3	420.4	420.5	420.5	420.2
5.....	420.4	420.2	420.3	420.4	420.3	420.1	420.5	420.3	420.4	420.5	420.6	420.1
6.....	420.5	420.2	420.4	420.4	420.3	420.1	420.5	420.2	420.4	420.4	420.5	420.2
7.....	420.6	420.3	420.2	420.3	420.2	420.1	420.4	420.2	420.3	420.4	420.4	420.1
8.....	420.5	420.3	420.3	420.2	420.3	420.2	420.4	420.2	420.3	420.4	420.3	420.1
9.....	420.6	420.4	420.2	420.3	420.2	420.1	420.3	420.3	420.3	420.4	420.3	420.1
10.....	420.6	420.5	420.2	420.2	420.3	420.7	420.3	420.3	420.3	420.5	420.4	419.9
11.....	420.5	420.4	420.3	420.2	420.3	420.9	420.2	420.2	420.4	420.5	420.6	420.0
12.....	420.5	420.3	420.3	420.2	420.3	420.8	420.3	420.2	420.4	421.0	420.5	419.8
13.....	420.5	420.2	420.3	420.3	420.2	420.9	420.2	420.3	420.4	420.4	420.5	419.8
14.....	420.6	420.2	420.2	420.3	420.3	421.0	420.2	420.2	420.4	420.3	420.4	419.8
15.....	420.5	420.2	420.3	420.2	420.3	421.0	420.3	420.3	420.4	420.4	420.4	419.9
16.....	420.6	420.1	420.3	420.2	420.3	420.9	420.4	420.2	420.4	420.4	420.4	419.8
17.....	420.4	420.2	420.4	420.3	420.3	420.9	420.4	420.2	420.5	420.5	420.8	419.7
18.....	420.5	420.3	420.5	420.3	420.4	420.9	420.5	420.3	420.4	420.4	420.8	419.7
19.....	420.4	420.2	420.4	420.2	420.3	421.0	420.4	420.3	420.4	420.4	420.6	419.9
20.....	420.4	420.3	420.4	420.3	420.2	421.0	420.4	420.2	420.3	420.4	420.5	420.1
21.....	420.3	420.3	420.3	420.4	420.3	420.6	420.5	420.2	420.4	420.4	420.5	420.2
22.....	420.3	420.3	420.4	420.5	420.2	420.4	420.4	420.1	420.4	420.3	420.4	420.1
23.....	420.4	420.3	420.4	420.4	420.2	420.3	420.4	420.1	420.5	420.2	420.3	420.0
24.....	420.2	420.3	420.4	420.3	420.2	420.3	420.5	420.2	420.4	420.2	420.5	420.1
25.....	420.3	420.4	420.3	420.2	420.3	420.4	420.4	420.1	420.4	420.2	420.5	420.0
26.....	420.3	420.3	420.2	420.3	420.2	420.3	420.3	420.2	420.5	420.2	420.5	420.0
27.....	420.3	420.3	420.2	420.4	420.2	420.2	420.4	420.2	420.4	420.2	420.5	420.1
28.....	420.2	420.2	420.2	420.4	420.2	420.1	420.4	420.2	420.4	420.2	420.4	420.2
29.....	420.2	420.3	420.3	420.3	420.2	420.1	420.4	.....	420.5	420.3	420.4	420.2
30.....	420.3	420.2	420.4	420.2	420.1	420.2	420.3	.....	420.5	420.3	420.5	420.2
31.....	420.3	420.2	.....	420.3	.....	420.1	420.3	.....	420.5	.....	420.4	.....

BARGE CANAL ABOVE LOCK No. 20, NEAR WHITESBORO

Gage No. 407

This new station, gage No. 407, is located at the west end of the southwest gate recess of lock No. 20, about a mile north of the village of Whitesboro. The water-surface elevation is obtained by measuring with a rod from a point in the top of the masonry, the elevation of which is 425.00 (B. C. datum). The gage bench-

mark, a point on the northwest wing wall, is at elevation 424.00 (B. C. datum).

The gage was read twice daily—at 6 A. M. and 6 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL ABOVE LOCK No. 20, NEAR WHITESBORO, for the year ended June 30, 1919

DAY	May	June	DAY	May	June	DAY	May	June
1.....	420.5	419.8	11.....	420.65	420.25	21.....	420.45	420.1
2.....	420.35	419.6	12.....	420.6	420.05	22.....	420.4	420.15
3.....	420.45	420.05	13.....	420.45	420.0	23.....	420.4	420.0
4.....	420.4	420.2	14.....	420.35	420.1	24.....	420.4	420.0
5.....	420.4	420.2	15.....	420.35	419.95	25.....	420.45	419.95
6.....	420.25	420.4	16.....	420.3	419.75	26.....	420.4	419.95
7.....	420.3	420.35	17.....	420.45	419.95	27.....	420.35	419.95
8.....	420.35	420.15	18.....	420.6	419.8	28.....	420.25	420.2
9.....	420.3	420.2	19.....	420.45	420.1	29.....	420.3	420.05
10.....	420.3	420.15	20.....	420.45	419.9	30.....	419.9	420.1
						31.....	419.7	.....

NOTE.—Readings began May 1, 1919.

BARGE CANAL BELOW LOCK No. 20, NEAR WHITESBORO

Gage No. 408

This new station, gage No. 408, is located on the southeast approach wall at foot of stairs of lock No. 20, about a mile north of the village of Whitesboro. The water-surface elevation of the lower pool is obtained by measuring with a rod from a point in the top of the masonry, the elevation of which is 408.00 (B. C. datum). The gage bench-mark is on the northwest wing wall of the lock at elevation 424.00 (B. C. datum).

The gage was read twice daily—at 6 A. M. and 6 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL BELOW LOCK No. 20, NEAR WHITESBORO, for the year ended June 30, 1919

DAY	May	June	DAY	May	June	DAY	May	June
1.....	403.9	402.85	11.....	404.65	403.8	21.....	403.8	403.75
2.....	404.35	403.25	12.....	404.2	403.85	22.....	403.8	403.5
3.....	404.1	403.1	13.....	404.15	403.4	23.....	403.85	403.55
4.....	404.1	403.9	14.....	403.95	403.35	24.....	404.0	403.8
5.....	404.05	403.95	15.....	403.95	403.3	25.....	404.1	403.65
6.....	404.05	403.85	16.....	403.8	403.75	26.....	403.85	404.05
7.....	404.15	403.8	17.....	403.85	403.65	27.....	403.85	403.85
8.....	404.05	404.05	18.....	404.1	404.1	28.....	403.85	403.95
9.....	404.05	403.95	19.....	403.9	403.3	29.....	403.85	404.1
10.....	404.15	403.85	20.....	403.8	403.9	30.....	403.7	403.7
						31.....	403.6	.....

NOTE.—Readings began May 1, 1919.

MOHAWK RIVER AT FRANKFORT

Gage No. 151

This station was established January 25, 1913, at the highway bridge over the Mohawk river on the Dyke road between Frankfort and North Frankfort about 10 miles east of Utica. The gage is a standard chain on the downstream side of the new steel bridge. It is read twice daily—morning and afternoon—to tenths. The water-surface indicated is that of the river about 1,600 feet below the new retention dam and about 200 feet below the end of the land-line running east from Barge canal lock No. 19 at Sterling creek.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT FRANKFORT, for the year ended June 30, 1919. C. F. Loring and Forrest O. Deyle, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	383.80	384.30	384.10	383.60	383.95	382.25	381.12	379.10	381.75	380.95	380.70
2	383.30	383.80	383.75	383.15	382.35	382.18	383.80	379.32	382.65	380.82	383.05
3	383.30	383.05	383.50	384.15	382.30	382.65	383.05	379.37	381.15	380.67	383.60
4	383.35	383.35	383.60	384.30	382.10	383.68	381.25	379.35	381.00	381.05	381.97
5	383.10	383.90	a	383.58	382.50	a	380.35	379.25	381.75	382.05	381.92
6	382.80	383.95	a	383.50	382.30	383.30	379.95	379.25	381.45	382.15	382.80
7	382.85	383.90	383.60	382.40	381.92	383.00	380.05	379.05	380.50	381.70	382.25
8	382.75	383.44	383.70	381.45	381.78	382.05	380.28	378.95	379.85	381.82	382.90
9	382.75	383.95	383.80	381.38	382.45	383.42	380.10	378.00	380.40	381.92	382.65
10	383.20	383.70	383.70	381.88	382.05	384.07	380.25	378.78	384.10	382.20	382.50
11	383.95	383.25	383.82	382.00	382.00	383.78	380.35	378.80	383.15	382.75	384.55
12	383.90	381.85	384.00	381.85	382.30	383.85	379.70	378.80	381.45	385.25	384.65
13	383.65	382.70	383.45	381.95	383.02	381.87	379.35	378.88	381.45	385.47	383.75
14	383.70	383.05	383.90	382.15	382.55	383.27	379.47	379.15	381.10	383.20	382.65
15	382.70	383.10	384.05	381.95	382.20	386.28	379.67	380.30	380.25	381.82	382.15
16	382.05	383.30	384.25	382.37	381.89	384.47	379.45	379.90	380.15	381.45	381.52
17	382.70	383.30	383.82	382.45	381.95	383.12	379.55	379.47	382.15	381.15	381.30
18	383.30	383.55	383.45	382.10	383.15	382.08	379.70	379.45	383.35	381.40	384.52
19	383.75	383.45	383.45	382.28	384.12	381.18	379.65	379.15	382.95	381.05	383.55
20	383.70	383.30	383.20	382.88	383.25	380.95	379.60	379.10	381.60	380.55	383.10
21	383.40	383.35	384.30	383.60	382.70	380.15	379.55	379.00	381.60	380.50	382.35
22	383.30	383.45	383.15	382.85	382.54	379.55	379.67	378.95	381.25	380.55	382.05
23	383.50	383.60	383.30	381.98	382.65	383.00	379.75	379.10	380.68	380.10	382.95
24	383.65	383.65	383.35	381.95	382.55	382.10	381.00	379.22	380.70	379.95	383.55
25	383.75	383.60	383.90	382.15	381.90	382.78	381.30	379.35	381.20	380.45	384.00
26	383.80	383.55	383.75	383.10	381.78	383.15	380.40	379.40	380.55	380.45	383.90
27	383.90	383.55	383.85	382.75	381.30	381.10	380.10	379.58	380.35	380.25	383.90
28	383.65	383.05	384.00	382.10	381.58	380.35	379.95	379.42	382.10	380.65	383.45
29	383.10	383.60	384.60	381.95	381.75	379.88	379.70	.....	381.25	380.78	382.40
30	383.20	383.50	383.90	383.35	382.72	379.55	379.65	.....	381.05	380.50	381.80
31	384.10	383.65	.....	385.65	.....	379.62	379.50	.....	381.15	.....	382.30

a No record.

NOTE.—Station discontinued May 31, 1919.

MOHAWK RIVER AT ILION

Gage No. 150

This station, established January 24, 1913, is located at the highway bridge over the Mohawk river opposite the village of Ilion and about 2 miles above Barge canal dam No. 14 at Herkimer. A standard chain gage, attached to the downstream truss near the center of the new bridge, is read to tenths twice daily—morning and afternoon.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT ILION, for the year ended June 30, 1919. P. C. Earl, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	384.55	384.25	384.25	383.6	384.1	382.7	380.9	379.6	382.2	380.75	380.7	382.75
2.....	383.16	384.2	383.75	383.4	383.3	383.0	381.55	379.5	382.2	380.6	382.2	382.65
3.....	383.4	383.65	383.6	384.7	382.95	383.4	382.65	379.15	381.15	380.7	383.5	382.7
4.....	383.35	383.5	383.65	384.8	382.6	383.9	381.85	379.05	380.85	a	382.0	382.6
5.....	383.3	384.1	383.9	383.8	382.85	383.75	380.85	379.2	381.45	a	381.7	382.7
6.....	382.95	384.4	383.95	383.4	381.65	383.65	380.15	378.85	381.35	a	381.9	382.85
7.....	382.8	383.85	383.85	382.7	380.95	383.2	379.95	378.65	380.65	a	382.45	382.85
8.....	382.65	383.7	383.7	381.2	381.05	382.85	380.05	378.5	379.85	a	382.85	382.6
9.....	382.55	384.0	383.85	380.65	381.1	383.05	380.15	378.55	380.2	a	382.5	382.4
10.....	383.2	383.9	384.05	381.75	381.1	382.15	380.25	378.6	383.55	a	382.55	382.55
11.....	384.05	383.05	384.0	381.95	381.65	383.15	380.15	378.6	382.8	a	384.6	382.65
12.....	383.95	382.55	383.95	381.9	382.05	382.8	379.9	378.7	381.65	385.0	384.4	382.3
13.....	383.7	382.75	384.05	382.2	382.45	382.05	379.35	379.95	381.65	385.05	383.6	382.25
14.....	383.85	383.2	384.05	382.35	382.3	382.85	379.3	380.65	381.1	382.6	382.45	382.4
15.....	383.0	383.5	384.2	382.6	382.65	386.5	379.3	380.75	380.15	381.5	382.0	382.4
16.....	381.95	383.4	384.25	382.6	382.6	383.4	379.2	380.0	379.7	381.15	381.4	382.25
17.....	382.55	383.6	383.95	382.55	381.95	383.4	379.35	379.3	381.5	381.05	381.35	382.15
18.....	383.5	383.65	382.85	382.65	383.1	382.8	379.5	379.15	382.7	381.0	384.25	382.2
19.....	383.75	383.15	383.15	382.8	382.8	381.55	379.6	379.0	382.65	380.75	383.5	382.25
20.....	383.45	383.5	383.4	382.7	382.7	381.05	379.55	379.2	381.3	380.55	382.95	382.3
21.....	383.4	383.3	383.95	382.3	383.6	380.85	379.6	379.15	381.1	380.5	382.35	382.45
22.....	383.3	383.55	383.45	382.5	383.35	*	379.6	379.0	380.8	380.35	382.0	382.55
23.....	383.55	383.55	383.35	382.3	382.9	382.8	379.65	379.1	380.65	380.0	382.7	382.5
24.....	383.65	383.85	383.85	381.9	382.45	*	a	379.05	380.65	379.85	383.2	382.75
25.....	383.7	383.65	383.85	382.0	382.05	383.6	381.15	379.35	381.4	380.45	383.85	382.75
26.....	383.85	383.55	383.7	383.1	381.8	382.6	380.6	379.6	380.6	380.35	383.8	382.7
27.....	383.9	383.7	383.7	382.8	381.55	381.35	379.8	379.7	380.65	380.45	383.85	382.75
28.....	383.65	383.4	384.6	382.85	381.4	380.55	379.65	379.85	382.3	380.65	383.4	382.75
29.....	383.1	383.9	383.8	382.05	381.3	379.95	379.6	.....	382.0	380.5	382.75	382.65
30.....	383.5	384.0	383.7	383.3	381.55	379.6	379.6	.....	381.4	380.3	382.7	382.55
31.....	384.15	383.65	.....	385.85	.....	380.05	379.85	.....	381.1	.....	382.7	.....

* Record not published. a No record.

MOHAWK RIVER AT MOHAWK STREET, HERKIMER

Gage No. 149

This station, established November 23, 1904, is located at the highway bridge immediately west of the Utica and Mohawk Valley electric railway bridge over the Mohawk river at Mohawk street, connecting the villages of Herkimer and Mohawk. A

standard chain gage, formerly on the upstream wing of the north, or left abutment of the bridge, is now located on the ends of the sidewalk stringers which project out from the east sidewalk of the highway bridge, between the second and third post from the north portal. This gage is about 100 feet above dam No. 14, which is of a movable type with a fixed sill at elevation 374.0. The change in location was made January 30, 1918, changing also the zero of the gage from elevation 374.00 to 375.00. The chain length is 19.77 feet. The gage bench-mark, a cross chiseled on the north abutment of the N. Y. S. railway bridge near angle of east wing and 2.7 feet from face of coping, is at elevation 391.33 (B. C. datum). The gage also indicates closely the water-surface above the canal guard-gate at this locality. Readings are taken twice daily—morning and afternoon—to half-tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT MOHAWK STREET BRIDGE, HERKIMER, for the year ended June 30, 1919. H. S. Bishton and C. G. Ranney, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	382.75	383.32	383.62	381.82	382.40	383.60	380.40	379.20	378.90	381.55	380.40	382.00
2.	382.88	383.75	383.65	381.80	382.39	383.60	380.40	379.05	378.92	381.52	380.50	382.50
3.	382.95	383.98	383.59	381.80	382.28	383.60	380.40	378.95	378.92	381.60	380.60	382.50
4.	383.20	383.65	383.52	381.72	382.30	383.65	380.40	378.80	378.95	381.60	381.55	382.40
5.	382.78	384.12	383.55	381.78	382.30	383.65	380.28	378.60	378.90	381.60	381.85	382.80
6.	382.70	383.95	383.60	a	382.28	383.62	380.20	378.62	378.90	381.50	382.50	382.95
7.	382.72	383.90	383.60	a	382.25	383.70	380.20	378.62	378.98	381.50	383.60	382.52
8.	382.95	383.82	383.62	a	382.22	383.70	380.20	378.60	379.25	381.52	383.80	382.45
9.	383.15	383.55	383.62	a	382.22	383.70	380.18	378.58	379.10	381.58	384.08	382.40
10.	383.22	383.40	383.58	a	382.10	383.68	380.05	378.50	379.20	381.60	384.40	382.55
11.	384.15	382.88	383.58	a	382.10	383.70	380.00	378.55	379.30	382.75	384.40	382.38
12.	384.18	382.80	383.28	a	382.10	383.70	380.00	378.60	379.50	384.00	384.45	382.20
13.	383.92	382.68	383.28	a	382.30	383.70	380.05	378.60	379.55	384.52	384.45	382.30
14.	384.00	382.52	383.20	a	382.30	383.75	380.10	378.58	379.70	384.52	384.40	381.90
15.	383.92	382.82	383.28	381.80	382.30	383.72	380.10	378.55	379.70	384.52	384.35	382.05
16.	383.72	383.10	383.22	381.80	382.45	383.70	380.00	378.60	379.70	384.45	384.30	381.90
17.	383.62	383.35	383.18	381.82	383.45	383.70	380.05	378.60	379.70	384.48	384.30	382.15
18.	383.42	383.58	383.35	381.80	383.45	383.75	380.10	378.65	379.72	384.35	384.20	382.20
19.	383.38	383.52	383.22	381.80	383.45	383.78	380.00	378.65	379.70	384.20	384.20	382.20
20.	383.35	383.25	383.38	382.30	383.50	383.78	380.00	378.70	379.78	384.18	384.20	382.18
21.	383.25	383.52	383.48	382.50	383.50	383.80	379.92	378.75	379.80	382.95	384.00	382.20
22.	383.28	383.45	383.45	382.50	383.50	383.75	379.90	378.80	379.80	382.55	384.00	382.60
23.	383.28	383.58	383.50	382.58	383.50	383.75	379.95	378.78	379.82	382.35	383.90	382.38
24.	383.20	383.48	383.48	382.58	383.50	383.78	379.90	378.80	379.85	381.75	383.90	382.08
25.	383.12	383.75	383.52	382.55	383.50	383.75	379.80	378.80	379.90	381.60	a	381.90
26.	383.30	383.82	383.62	382.50	383.50	383.75	379.80	378.82	379.92	381.50	a	382.30
27.	382.98	383.80	383.58	382.50	383.55	383.78	379.70	378.82	379.98	381.00	a	382.68
28.	382.90	383.72	383.50	382.58	383.55	383.78	379.62	378.82	380.28	380.45	a	382.85
29.	382.92	383.62	383.55	382.48	383.50	383.35	379.55	.....	381.30	380.20	a	383.02
30.	383.05	383.58	381.80	382.50	383.58	382.15	379.50	.....	381.50	380.22	a	382.48
31.	383.32	383.58	.....	382.50	.....	381.30	379.45	.....	381.55	.....	a	.....

a No record.

MOHAWK RIVER AT WASHINGTON STREET, HERKIMER

Gage No. 148

This station, established February 4, 1913, is located at the Washington street bridge over the Mohawk river, opposite the village of Herkimer. It is about 4,700 feet below dam No. 14 and about 2,700 feet above the mouth of West Canada creek. This section of the river is not canalized. The gage is a standard chain attached to the upstream side of the bridge and is read twice daily—morning and afternoon—to hundredths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT WASHINGTON STREET BRIDGE, HERKIMER, for the year ended June 30, 1919. H. S. Bishton, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	376.75	374.55	374.26	374.78	374.42	374.45	375.00	375.18	375.20	377.10	377.90
2	377.05	374.70	374.22	374.76	374.42	374.45	375.00	375.18	375.20	377.00	378.40
3	377.75	374.62	374.24	374.77	374.42	374.45	375.00	375.08	375.20	377.10	378.85
4	376.60	374.55	374.22	374.76	374.42	374.46	375.00	375.03	375.20	377.10	379.75
5	376.14	374.52	374.22	374.76	374.42	374.46	375.00	375.10	375.25	377.10	380.00
6	375.90	374.55	374.22	a	374.42	374.46	375.20	375.08	375.28	377.10	380.40
7	375.16	374.55	374.19	a	374.40	374.46	375.20	374.86	375.25	377.10	380.60
8	375.55	374.65	374.21	a	374.40	374.47	375.30	374.70	375.30	377.20	380.60
9	375.32	374.55	374.24	a	374.40	374.47	375.30	374.70	375.40	378.00	380.70
10	375.18	374.42	374.22	a	374.40	374.47	375.30	374.70	375.40	378.10	380.80
11	375.65	374.48	374.26	a	374.40	374.47	375.32	374.72	375.45	379.70	380.80
12	376.20	374.42	374.12	a	374.40	374.49	375.90	374.70	375.50	380.80	380.80
13	375.92	374.28	374.06	a	374.40	374.49	375.85	374.70	375.48	380.90	380.80
14	375.75	374.30	374.04	a	374.35	374.48	375.85	374.72	375.50	380.90	380.70
15	375.58	374.24	374.04	374.75	374.40	374.48	375.80	374.74	375.50	380.90	380.70
16	375.58	374.24	374.05	374.80	374.40	374.48	375.80	374.75	375.50	380.70	380.60
17	375.38	374.24	374.05	374.80	374.38	374.48	375.90	374.74	375.50	380.50	380.50
18	375.22	374.22	374.07	374.72	374.40	374.48	375.90	374.81	375.50	380.40	380.40
19	375.18	374.21	374.06	374.71	374.35	374.48	375.90	374.86	375.50	380.20	380.40
20	375.25	374.14	374.06	374.44	374.30	374.48	375.88	374.95	375.48	380.15	380.35
21	375.12	374.18	374.08	374.46	374.30	374.48	375.90	375.00	376.00	379.35	380.30
22	375.12	374.17	374.14	374.42	374.32	374.48	375.90	375.10	376.10	379.75	380.30
23	375.08	374.21	374.18	374.44	374.33	374.48	375.86	375.10	376.20	378.30	380.19
24	375.12	374.22	374.25	374.44	374.35	374.48	375.82	375.10	376.25	378.50	380.12
25	374.90	374.25	374.20	374.46	374.40	374.49	375.80	375.10	376.30	377.10	a
26	375.08	374.40	374.18	374.55	374.45	374.48	375.80	375.10	376.40	377.30	a
27	374.80	374.32	374.24	374.50	374.45	374.48	375.59	375.10	376.40	377.50	a
28	374.58	374.24	374.24	374.48	374.45	374.48	375.54	375.10	376.50	377.80	a
29	374.62	374.20	374.24	374.44	374.45	374.73	375.50	.....	376.50	377.80	a
30	374.55	374.23	374.24	374.43	374.44	374.73	375.48	.....	376.90	377.70	a
31	374.68	374.24	.....	374.42	.....	374.78	375.33	.....	377.05	.....	a

a No record.

NOTE.— Station discontinued May 31, 1919.

MOHAWK RIVER ABOVE STATE DAM, LITTLE FALLS

Gage No. 147

This station, established February 4, 1904, is located just above the upper, or State dam on the Mohawk river at Little

Falls. A staff gage, attached to the west wing-wall of the culvert over the stream from a waste-weir of the old Erie canal and about 400 feet upstream from the Hanson avenue bridge over the old canal feeder, was used until October 1, 1916. From that date until July 5, 1917, the concrete gate on the south wall of the Little Falls guard-gate was used. On July 5, 1917, a standard Type A gage was secured to the upper return wall of the south abutment of the guard-gate. This gage has a range of 12 feet, between elevations 360.0 and 372.0. A standard bench-mark plug was set in the wall near the gage at elevation 371.0 (B. C. datum). The State dam with crest averaging about elevation 363.0 is not affected by Barge canal construction.

Readings are taken twice daily—at 8 A. M. and 4 P. M.—to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE STATE DAM AT LITTLE FALLS, for the year ended June 30, 1919. Albert H. Wilson, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	364.35	363.55	363.75	363.85	366.05	364.15	364.45	364.20	365.92	364.40	64.32	363.95
2	364.12	363.55	363.55	363.75	365.15	364.10	365.80	364.35	364.60	364.38	364.90	363.70
3	364.02	363.55	363.40	364.10	365.00	364.15	365.10	364.10	364.50	364.40	365.10	363.85
4	363.85	363.55	363.50	364.15	364.40	364.20	364.80	364.10	364.50	364.48	364.65	363.85
5	363.75	363.50	363.45	364.05	364.65	364.85	364.70	364.10	364.68	364.52	365.00	363.88
6	363.60	363.65	363.65	364.20	364.85	364.45	364.70	364.05	364.48	364.85	364.45	363.85
7	363.60	363.80	363.65	365.15	364.25	364.45	364.40	364.05	364.12	364.82	364.62	363.82
8	363.55	363.75	363.55	364.60	364.15	364.45	364.40	364.00	363.98	364.82	364.38	363.75
9	363.55	363.85	363.55	364.45	364.05	364.80	364.50	363.90	364.12	365.08	364.45	363.70
10	363.65	364.00	363.65	364.10	364.20	365.40	364.40	363.90	364.15	365.55	364.40	363.65
11	363.80	363.80	363.45	363.90	364.10	364.40	364.40	363.90	364.90	365.80	365.08	363.70
12	363.75	363.55	363.50	363.95	364.00	364.50	364.40	363.85	364.40	367.50	365.38	363.65
13	363.95	363.45	363.85	363.85	363.95	364.60	364.45	363.92	364.52	367.25	365.10	363.65
14	364.10	363.40	363.90	363.98	363.85	364.75	364.40	364.08	364.10	365.95	364.92	363.58
15	364.10	363.45	363.65	363.95	363.90	365.80	364.40	364.35	363.98	365.25	364.45	363.65
16	364.00	363.45	363.55	364.05	363.85	365.35	364.40	364.40	364.08	364.92	364.32	363.70
17	364.00	363.80	364.05	363.90	364.05	364.85	364.40	364.00	364.42	364.85	364.18	363.70
18	363.78	363.55	364.15	364.00	364.25	364.75	364.40	364.00	365.42	364.88	364.90	363.65
19	363.85	363.45	364.10	363.85	364.90	364.70	364.40	363.90	364.88	364.75	365.25	363.58
20	363.80	363.35	363.90	363.80	364.30	364.70	364.42	363.82	364.60	364.62	364.30	363.65
21	363.80	363.45	364.18	365.02	364.85	364.60	364.32	363.85	364.65	364.50	364.55	363.60
22	363.58	363.55	364.30	364.45	364.65	364.80	364.22	363.92	364.60	364.45	365.08	363.60
23	363.55	363.45	364.25	364.40	364.40	365.30	365.10	363.95	364.28	364.38	365.05	363.60
24	363.50	363.55	363.85	364.10	364.40	365.30	365.05	363.85	364.28	364.48	364.58	363.65
25	363.55	363.35	363.95	364.00	364.35	365.45	364.75	363.85	364.15	364.42	364.32	363.58
26	363.55	363.45	364.32	364.50	364.20	365.15	364.35	363.90	364.12	364.32	364.28	363.55
27	363.52	363.45	364.10	364.95	364.25	364.80	364.18	363.82	364.12	364.40	364.22	363.65
28	363.50	363.45	363.90	364.38	364.30	364.55	364.20	363.90	365.10	364.45	364.25	363.70
29	363.45	363.35	364.10	364.30	364.35	364.40	364.25	.....	364.60	364.48	364.12	363.75
30	363.45	363.35	363.80	364.85	364.30	364.40	364.22	.....	364.50	364.35	364.00	363.60
31	363.52	363.35	.....	366.30	.....	364.40	364.20	.....	364.48	.....	363.95	.....

MOHAWK RIVER BELOW LOCK No. 17, LITTLE FALLS

This station is located on the Mohawk river at the lower end of lock No. 17 in the city of Little Falls. It is about 3.7 miles above and at the head of the canalized pool formed by the Rocky Rift dam and about 0.9 mile above the suspension bridge. The concrete vertical staff gage at the lower end of the lock is read once daily — at noon — to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER BELOW LOCK No. 17, LITTLE FALLS, for the year ended June 30, 1919. Harry L. Crouse and A. H. Wilson, Observers

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	322.4	326.2	324.0	321.7	321.4	323.5	321.8	321.8	320.7
2	322.2	325.2	323.7	324.1	322.8	322.5	321.8	322.4	320.8
3	322.3	324.6	323.7	323.2	321.0	321.8	321.7	322.8	322.4
4	323.0	324.0	323.8	322.5	321.1	321.5	322.1	322.3	322.4
5	323.5	324.2	324.0	322.3	321.1	322.3	322.5	322.5	322.5
6	322.8	323.7	324.0	322.1	321.0	321.9	322.7	322.4	322.6
7	324.6	323.8	324.1	321.4	321.0	321.5	322.4	322.1	322.7
8	324.2	323.5	324.1	322.3	320.9	320.9	322.4	322.4	322.5
9	324.0	323.4	324.5	322.0	320.8	321.0	323.1	322.1	322.7
10	323.6	323.3	324.4	322.0	320.9	323.0	323.6	322.0	322.5
11	322.9	323.3	323.9	321.4	320.9	322.5	324.2	323.2	322.5
12	323.0	323.3	324.1	321.6	320.9	321.5	327.45	323.4	322.5
13	323.7	323.3	323.9	321.5	321.0	321.9	326.8	323.1	322.5
14	323.2	323.2	324.7	321.5	321.0	321.5	324.7	323.5	322.4
15	323.4	323.4	326.8	321.8	321.4	321.1	323.4	321.9	322.5
16	323.7	323.1	326.8	321.8	321.6	321.0	323.0	321.7	322.5
17	323.5	323.4	324.7	321.8	321.2	322.0	322.8	321.3	322.5
18	323.3	324.0	323.9	321.5	321.2	323.7	322.8	322.7	322.6
19	323.4	324.1	326.8	321.6	321.0	322.5	322.5	323.4	322.5
20	323.2	324.0	322.7	321.5	320.8	321.9	322.4	322.8	322.5
21	325.45	323.9	322.1	321.6	320.8	322.2	321.9	323.2	322.4
22	324.9	324.0	321.9	321.7	320.8	321.8	321.8	321.9	322.5
23	324.0	324.0	323.5	321.6	320.8	321.5	321.8	322.2	322.5
24	323.4	323.7	322.7	323.7	320.7	321.5	321.8	322.2	322.5
25	322.8	324.2	323.6	322.8	320.7	321.4	321.9	322.0	322.5
26	323.5	323.9	323.5	322.2	320.8	321.4	321.6	321.8	322.5
27	324.5	323.9	322.7	321.5	321.0	321.3	321.5	322.0	322.5
28	323.7	323.5	321.9	321.6	320.8	322.5	321.8	321.7	322.5
29	323.5	324.0	321.7	321.4	.....	321.8	321.7	321.4	322.5
30	324.0	324.0	321.5	321.5	.....	322.1	321.5	321.1	322.5
31	327.1	.....	321.6	321.4	.....	322.0	.....	321.1	.....

NOTE.— Transferred from "Above Rocky Rift Dam, No. 12," April 1, 1916. Regular daily readings began October 1, 1918.

BARGE CANAL AT INDIAN CASTLE

Gage No. 145

This station indicates the water-surface in the Barge canal above the guard-gate at Indian Castle, about 5 miles east of Little Falls. Castle creek enters the Barge canal from the south, just west, or above the guard-gate, and is diverted westward through the canal land-line about 3,400 feet, entering the Mohawk river just above the Rocky Rift dam. Low navigable surface in this section of the canal is at elevation 322.5.

A vertical staff gage on the upstream, or west face of the guard-gate is read at irregular intervals.

Daily elevation of water-surface (B. C. datum) of BARGE CANAL ABOVE GUARD-GATE, INDIAN CASTLE, for the year ended June 30, 1919. Harry L. Crouse, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	323.1	322.9							322.8			
2	323.5	322.9									322.0	
3	323.5	322.7							321.8			
4	323.3	322.7										
5	323.1	322.7								322.3		
6	323.0	322.9										
7	322.9	323.0										
8	322.9	322.9						321.0	321.8			
9	322.9	323.8										
10	323.5								322.8		321.1	
11	323.3									323.7		
12	323.6											
13	323.4											
14	323.5											
15	323.9							321.4	321.1			
16	323.7											
17	323.2								321.8			
18	323.5								323.3			
19	323.3											
20	323.3											
21	323.2											
22	322.9							320.9	322.1			
23	323.2											
24	323.1											
25	322.9											
26	322.8									321.7		
27	322.6											
28	322.5											
29	322.5								322.0			
30	322.6											
31	323.0											

NOTE.—Station discontinued June 30, 1919.

MOHAWK RIVER AT ST. JOHNSVILLE

Gage No. 144

This station, established January 22, 1913, is located at the highway bridge crossing the Mohawk river at the village of St. Johnsville. It is about 1.3 miles below the Mindenville retention dam opposite Barge canal lock No. 16 and about 5.3 miles above the movable dam (No. 11) at Fort Plain. A standard chain gage attached to the upstream side of the bridge is read twice daily—at about 8 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT ST. JOHNSVILLE, for the year ended June 30, 1919. H. C. Dowling, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	302.75	302.4	302.25	301.3	303.85	302.35	297.25	295.9	298.7	297.85	301.5
2	302.2	302.35	302.0	302.2	302.95	301.75	301.5	299.2	298.25	297.75	302.4
3	302.5	302.45	302.1	302.35	302.75	301.55	299.1	296.05	297.55	297.5	302.75
4	302.2	302.35	302.05	302.35	302.75	301.75	298.4	296.1	297.45	297.95	301.85
5	302.3	302.55	302.3	302.2	302.6	302.3	297.3	296.05	298.45	299.0	302.5
6	302.05	302.35	302.15	302.15	302.25	301.7	297.0	295.85	297.8	299.1	302.05
7	302.25	302.7	302.0	303.3	302.35	301.6	296.7	295.65	296.8	299.25	302.2
8	302.35	302.15	302.3	302.25	302.5	299.25	296.85	295.5	296.05	299.55	302.35
9	302.35	302.55	302.2	302.45	302.05	298.25	296.85	295.45	296.7	300.45	302.0
10	302.8	302.55	302.1	302.25	302.3	298.15	296.6	295.45	299.8	300.9	301.9
11	302.35	302.0	302.2	301.95	302.25	297.3	296.5	295.55	298.9	301.75	303.1
12	302.5	30.0	302.15	302.15	302.15	297.45	296.55	295.7	297.6	305.4	302.8
13	302.4	302.0	302.4	302.05	302.1	297.2	296.6	295.65	297.95	304.55	302.7
14	302.4	301.95	302.2	302.2	302.0	297.6	296.65	295.8	297.15	302.0	302.3
15	302.7	302.2	302.05	302.25	301.95	301.45	296.7	296.3	296.5	301.05	300.2
16	302.65	302.25	302.1	302.2	302.4	300.2	296.6	296.05	296.1	300.5	302.05
17	302.35	302.05	302.35	302.05	301.85	298.7	296.55	296.05	297.8	300.45	301.5
18	302.5	302.5	302.35	302.0	302.9	297.95	296.4	296.0	300.7	301.2	302.95
19	302.35	302.35	302.35	301.95	302.85	297.6	296.05	296.35	299.6	301.1	302.85
20	302.4	302.15	302.00	301.95	302.1	297.35	295.4	297.7	299.25	300.5	302.0
21	302.3	302.35	302.75	303.2	302.9	296.9	296.2	297.0	299.5	300.55	302.15
22	302.45	302.4	302.1	302.6	302.05	296.15	296.2	297.55	299.25	301.45	302.1
23	302.2	302.4	302.1	302.55	302.15	302.15	296.2	295.5	298.5	300.75	302.35
24	302.3	302.35	302.1	302.8	302.1	300.45	298.4	295.2	298.35	300.55	302.15
25	302.45	302.4	302.15	302.3	302.55	302.6	298.55	295.6	297.85	301.05	302.05
26	302.25	302.35	303.0	302.6	301.9	301.15	297.35	295.55	297.65	301.05	302.05
27	302.25	302.05	302.25	302.85	301.8	299.1	296.7	295.55	297.45	301.1	302.05
28	301.9	302.1	302.65	302.25	301.7	297.9	296.3	295.4	300.5	301.85	301.75
29	301.8	302.2	302.2	301.8	302.4	297.2	296.25	.....	298.85	302.25	301.8
30	302.55	302.35	301.9	302.9	302.5	297.15	296.15	.....	298.45	301.75	301.55
31	302.55	302.1	.....	305.85	.....	297.35	296.2	.....	298.35	.....	301.85

NOTE.—Station discontinued May 31, 1919.

MOHAWK RIVER AT FORT PLAIN

Gage No. 143

This station, established December 30, 1905, is located at the River street highway bridge over the Mohawk river, connecting the villages of Fort Plain and Nelliston. It is about 0.4 mile below the movable dam (No. 11) at Fort Plain and about 2.9 miles above the movable dam (No. 10) at Canajoharie. The gage is a standard chain secured to the downstream side of the bridge, about 50 feet from the south, or right abutment and is read twice daily—at about 8 A. M. and 5 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT FORT PLAIN, for the year ended June 30, 1919. Clark Keyser, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	294.35	294.05	294.6	294.2	295.3	293.75	288.9	286.9	293.15	288.95	293.75
2.....	294.45	294.25	294.25	294.3	294.55	293.75	293.25	286.85	291.9	288.65	294.75
3.....	294.45	294.4	294.35	294.5	294.65	294.25	291.15	288.9	289.8	288.6	295.2
4.....	294.35	293.8	294.35	294.35	294.6	294.05	289.55	288.75	289.2	289.2	295.2
5.....	294.25	294.3	294.3	294.35	294.45	293.85	288.75	288.55	290.05	290.2	294.95
6.....	294.15	294.3	294.35	294.55	294.6	293.95	288.5	288.95	289.4	290.45	294.65
7.....	294.15	294.55	294.45	295.25	294.65	294.0	288.05	288.65	288.15	290.65	294.85
8.....	294.45	293.9	294.4	294.75	294.35	293.35	288.2	288.85	287.75	291.1	295.05
9.....	294.3	294.5	294.55	294.85	294.65	290.85	287.7	289.35	288.5	292.05	294.8
10.....	294.3	294.35	294.5	294.8	294.65	289.55	287.85	289.95	291.2	292.4	295.15
11.....	294.6	294.45	294.65	294.55	294.5	289.5	287.7	291.5	290.3	292.95	295.25
12.....	293.9	294.5	294.45	294.55	294.35	289.3	288.85	290.95	289.2	297.1	294.45
13.....	294.45	294.2	294.65	294.55	294.45	288.65	292.45	290.65	289.3	296.4	295.2
14.....	294.45	294.3	294.45	294.6	294.35	289.15	293.05	290.85	288.65	293.3	294.75
15.....	294.2	294.3	294.35	294.65	294.25	291.9	292.85	290.85	287.85	291.05	294.75
16.....	294.3	294.6	294.25	294.85	294.4	291.35	292.0	292.0	288.85	290.9	294.65
17.....	294.25	293.95	294.35	294.45	294.45	289.8	291.55	293.05	289.3	292.45	294.2
18.....	294.55	294.1	294.62	294.35	294.9	288.95	290.9	291.6	291.9	292.85	294.55
19.....	294.45	294.45	294.45	294.55	294.55	288.45	290.5	289.95	291.05	292.55	294.95
20.....	294.55	294.1	294.45	294.75	294.65	288.2	290.55	289.85	290.6	292.3	295.05
21.....	294.45	294.35	294.6	295.6	294.05	287.95	290.15	290.15	291.15	292.4	294.6
22.....	294.25	294.55	294.55	294.6	294.2	287.75	289.65	289.5	290.85	293.25	295.05
23.....	293.9	294.2	294.35	294.3	294.25	292.9	289.7	290.05	290.35	293.45	294.65
24.....	294.05	294.1	294.4	293.8	294.0	292.65	290.8	289.95	289.8	293.7	295.1
25.....	294.05	294.15	294.25	294.45	294.4	292.55	291.55	288.95	289.45	294.5	294.85
26.....	294.1	294.35	294.5	294.95	293.95	291.9	290.3	288.9	289.25	293.9	294.65
27.....	294.0	294.05	294.6	294.75	294.1	290.3	289.25	291.4	289.3	293.55	294.75
28.....	293.9	294.05	294.9	294.7	294.25	289.85	288.15	291.45	291.9	293.75	294.55
29.....	293.8	294.15	294.6	295.15	294.45	288.7	288.05	.....	290.35	294.05	294.4
30.....	294.45	294.4	294.15	297.3	294.2	288.15	287.85	.....	289.8	293.95	294.4
31.....	294.15	294.4	.....	295.55	.....	288.4	287.35	.....	289.55	.....	294.45

NOTE.—Station discontinued May 31, 1919.

MOHAWK RIVER AT CANAJOHARIE

Gage No. 142

This station, established September 16, 1908, is located at the highway bridge over the Mohawk river connecting the villages of Canajoharie and Palatine Bridge. It is about 1,900 feet below the movable dam (No. 10) at Canajoharie. A standard chain gage attached to the bridge is read twice daily—at 9 A. M. and 3 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT CANAJOHARIE
for the year ended June 30, 1919. Guy Bracebridge, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	285.42	285.32	285.42	285.42	287.52	285.72	282.12	283.22	284.12	282.92	286.42
2.....	285.42	285.22	285.42	285.42	286.42	285.82	283.92	28.52	283.52	281.32	286.52
3.....	285.32	285.32	285.32	285.42	286.22	285.82	283.92	283.52	281.92	281.52	286.42
4.....	285.22	285.32	285.42	285.42	286.22	285.52	282.12	283.52	281.92	282.12	286.42
5.....	285.22	285.52	285.42	285.42	285.52	285.52	282.12	283.12	282.92	282.12	286.42
6.....	285.22	285.52	285.52	285.42	285.52	285.42	281.12	283.12	281.52	282.12	286.12
7.....	285.32	285.52	285.52	285.42	285.52	285.12	280.72	283.12	280.62	283.72	286.12
8.....	285.22	285.42	285.52	285.12	285.52	285.12	280.52	283.12	280.62	283.92	286.12
9.....	285.42	285.52	285.52	286.02	285.52	285.12	280.52	281.62	282.52	284.52	285.92
10.....	285.42	285.52	285.52	285.82	285.52	281.52	280.52	281.12	282.52	285.32	285.72
11.....	285.42	285.52	285.52	285.82	285.12	281.52	280.52	280.52	282.92	286.12	286.72
12.....	285.42	285.32	285.52	285.82	285.12	281.52	283.12	280.52	282.92	281.12	286.72
13.....	285.42	285.32	285.52	285.72	285.12	281.52	283.52	280.52	282.52	280.12	286.42
14.....	285.52	285.32	285.52	285.52	284.82	281.62	284.52	281.52	281.82	286.12	286.12
15.....	286.12	285.52	286.52	285.52	285.52	285.52	284.52	281.92	279.92	282.82	286.12
16.....	285.42	285.52	285.92	285.52	285.52	285.52	284.12	280.52	281.22	283.52	285.92
17.....	285.42	285.52	286.12	285.42	284.82	285.12	283.52	280.52	282.12	284.52	285.72
18.....	285.42	285.52	285.92	285.52	285.52	281.52	283.52	280.22	282.12	284.32	285.82
19.....	285.42	285.52	285.92	285.52	286.42	281.42	282.42	280.22	284.42	283.92	286.12
20.....	285.42	285.42	285.92	285.92	286.42	281.52	282.32	280.02	284.42	283.72	286.12
21.....	285.52	285.42	285.92	286.82	286.22	281.52	282.12	280.02	283.52	284.22	286.12
22.....	285.52	285.42	285.72	286.02	285.52	281.52	282.22	280.02	282.12	284.22	286.42
23.....	285.52	285.52	285.72	285.52	285.52	281.82	283.12	280.02	282.12	284.52	286.42
24.....	285.52	285.52	285.52	285.52	285.52	281.82	284.42	280.02	282.12	284.52	286.42
25.....	285.52	285.42	285.42	285.52	285.52	281.82	284.42	280.02	282.12	284.22	286.12
26.....	285.52	285.42	286.52	286.02	285.52	281.82	283.52	280.22	282.12	284.22	285.72
27.....	285.52	285.42	286.52	286.22	285.52	281.82	283.12	280.42	282.22	285.92	285.72
28.....	285.52	285.42	285.52	286.02	285.52	281.82	282.42	280.42	282.22	285.92	285.72
29.....	285.52	285.42	285.42	286.02	285.52	281.02	282.82	.....	283.12	286.12	285.72
30.....	285.52	285.42	285.42	286.42	285.52	280.92	282.82	.....	282.92	286.12	285.82
31.....	285.42	285.42	.....	280.82	.....	280.92	283.22	.....	282.92	.....	285.82

NOTE.—Station discontinued May 31, 1919.

MOHAWK RIVER AT FONDA

Gage No. 141

This station, established April 29, 1906, is located at the highway bridge over the Mohawk river connecting the villages of Fonda and Fultonville. This bridge is about 4.6 miles below movable dam No. 9, near Yosts, and about 5 miles above movable dam No. 8 and the mouth of Schoharie creek at Tribes Hill.

Previous to 1913 discharge was computed at this station, but this was discontinued, owing to the destruction of the control, due to Barge canal construction work, and the station has since been maintained for surface elevations only.

A standard chain gage, No. 141, attached to the downstream side of the middle span of the bridge was read twice daily—A. M. and P. M.—to tenths, except Sundays, when it was read once—P. M.—only.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT FULTONVILLE BRIDGE, FONDA, for the year ended June 30, 1919. Richard Kilmartin, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	278.2	278.3	278.1	278.35	279.4	278.5	273.3	272.95	273.45	274.95	278.05	278.4
2.....	278.05	278.35	278.35	278.35	278.8	278.35	277.55	273.0	275.6	274.85	278.4	278.6
3.....	278.5	278.55	278.55	278.45	278.8	278.0	276.35	273.0	274.9	274.55	278.9	278.5
4.....	278.4	278.3	278.45	278.35	279.05	278.0	276.4	273.1	274.25	274.5	278.6	278.5
5.....	278.45	278.25	278.45	278.5	a	278.1	275.6	272.7	275.1	275.4	278.9	278.3
6.....	278.45	278.55	278.35	278.8	278.2	278.35	273.45	272.8	274.9	275.6	278.6	278.45
7.....	278.4	278.4	278.3	278.9	278.25	277.75	273.4	272.65	274.45	275.85	278.35	278.4
8.....	278.45	278.05	278.3	278.5	278.35	277.4	273.25	272.5	273.0	276.0	278.8	278.0
9.....	278.35	278.3	278.15	278.55	278.45	277.1	273.65	272.2	277.0	276.25	278.65	277.6
10.....	278.6	278.35	278.55	278.25	278.4	277.25	273.05	272.0	276.45	276.85	278.95	278.05
11.....	278.25	278.4	278.55	278.4	a	276.2	272.9	272.35	275.75	277.85	279.5	278.35
12.....	278.4	278.35	278.65	277.9	278.25	273.45	273.0	272.4	274.3	281.35	278.75	278.85
13.....	278.45	278.4	278.6	278.2	278.45	273.35	272.9	272.4	274.2	280.9	278.9	278.05
14.....	278.5	278.45	278.45	278.45	278.3	273.7	273.3	272.55	273.9	278.7	278.35	278.0
15.....	278.55	278.1	278.5	278.35	278.05	275.8	273.35	272.2	273.25	276.55	278.2	278.2
16.....	278.7	278.35	278.35	278.45	278.25	276.35	273.35	273.0	273.5	275.6	278.15	278.8
17.....	278.1	278.45	278.5	278.35	278.6	274.9	273.6	272.7	274.7	275.7	278.55	278.5
18.....	278.45	278.3	278.8	278.15	279.1	274.15	273.4	272.85	276.3	276.05	279.1	278.35
19.....	278.25	278.35	278.45	278.2	278.65	273.5	273.4	272.65	276.15	276.45	279.25	278.55
20.....	278.45	278.25	278.6	278.2	278.55	273.4	273.3	272.45	276.45	276.7	278.5	278.4
21.....	278.2	278.35	278.7	278.5	278.65	273.35	273.05	272.15	276.55	277.1	278.5	278.55
22.....	278.35	278.25	278.7	278.55	279.1	274.0	273.15	271.8	276.25	278.0	278.45	278.5
23.....	278.4	278.25	278.55	278.05	278.55	276.55	273.1	271.7	275.6	278.25	278.7	277.65
24.....	278.15	278.35	278.65	278.0	278.5	277.1	274.25	271.5	274.65	278.4	278.6	277.95
25.....	278.35	278.0	278.7	278.35	278.3	a	274.15	271.75	274.4	278.6	278.5	278.35
26.....	278.55	277.85	278.7	278.35	278.0	277.65	274.0	272.05	274.35	278.65	278.35	278.35
27.....	278.25	278.15	278.5	279.0	278.45	276.4	273.65	272.2	a	278.1	278.2	278.6
28.....	278.4	278.25	278.75	278.5	278.6	274.4	273.3	272.3	a	278.25	278.3	278.8
29.....	278.25	278.45	278.3	278.45	278.75	274.0	273.45	.....	275.55	278.7	278.2	278.5
30.....	278.05	278.35	278.05	278.75	278.65	273.4	273.45	.....	275.5	278.6	a	278.35
31.....	278.35	278.35	.....	282.0	.....	273.3	273.05	.....	275.45	.....	a	.....

a No record.

MOHAWK RIVER AT TRIBES HILL

Gage No. 140

This station, established January 7, 1904, is located at the suspension bridge over the Mohawk river connecting the villages of Tribes Hill and Fort Hunter. This bridge lies just below movable dam No. 8 at Tribes Hill and over the lower guide-wall of Barge canal lock No. 12.

Discharge was formerly computed at this station, but was discontinued because of the destruction of the control by Barge canal construction. The station is now maintained for water-surface elevations only. The gage is a standard chain, attached to the downstream side of the bridge near the left bank or north end and is read twice daily—at about 8 A. M. and 4 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT TRIBES HILL
for the year ended June 30, 1919. A. W. Van Vliet, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	267.00	267.00	266.85	267.05	268.20	267.35	262.70	262.10	264.15	264.40	266.95	267.55
2.....	267.05	267.00	267.20	267.10	267.35	266.90	267.80	261.20	266.15	263.95	267.60	267.50
3.....	267.05	267.05	267.20	267.35	267.30	267.05	266.50	261.60	264.65	263.60	267.55	267.10
4.....	267.05	267.10	267.25	267.05	267.45	266.90	264.80	261.80	263.85	264.75	267.45	267.30
5.....	267.15	266.65	267.20	267.20	267.50	266.95	263.40	261.80	264.80	265.75	267.65	267.35
6.....	267.30	267.15	267.15	266.65	267.05	267.20	262.85	261.70	264.80	266.80	267.40	267.45
7.....	266.95	267.10	267.10	267.20	266.90	267.15	262.70	261.50	263.35	266.70	267.50	267.45
8.....	267.10	266.75	267.25	267.40	267.40	266.60	262.75	261.20	262.40	266.80	267.60	267.25
9.....	267.20	266.65	267.15	267.50	267.10	266.85	262.80	260.85	262.70	267.00	267.20	267.20
10.....	267.25	267.30	267.25	267.05	267.35	265.55	261.95	260.70	267.25	267.00	267.30	267.35
11.....	267.10	267.15	267.30	267.15	267.20	265.20	261.75	260.70	265.90	267.55	268.60	267.30
12.....	267.10	267.35	267.35	266.90	267.20	262.90	261.60	260.80	264.30	270.50	267.90	267.35
13.....	267.25	267.20	267.40	267.20	267.15	262.90	263.65	260.45	264.25	269.85	269.05	267.25
14.....	267.05	267.20	267.20	267.30	267.05	262.90	264.50	260.90	263.75	270.50	267.55	267.20
15.....	267.10	267.05	267.20	267.15	267.05	266.00	264.60	261.85	262.85	266.50	267.65	267.40
16.....	267.35	267.25	267.05	267.25	266.85	266.25	264.40	262.60	262.10	264.85	267.60	267.35
17.....	267.15	267.20	267.25	267.40	267.00	264.65	264.10	261.40	264.05	265.70	267.40	266.95
18.....	267.30	267.05	267.30	267.10	267.10	263.70	264.00	261.50	266.85	265.65	268.55	267.00
19.....	267.15	267.00	267.20	267.30	267.10	262.85	263.75	261.00	266.60	265.50	268.10	267.30
20.....	267.00	267.20	267.35	267.15	267.30	262.70	263.20	260.70	265.70	264.65	267.60	267.10
21.....	267.00	267.20	267.30	267.75	267.15	262.55	263.70	260.80	266.10	265.10	267.25	267.25
22.....	266.80	267.10	267.15	267.50	267.00	261.95	263.25	260.50	266.10	265.70	267.55	267.20
23.....	267.05	267.10	267.00	267.35	267.25	265.70	263.10	260.70	265.15	267.05	267.60	266.85
24.....	267.15	267.15	267.05	267.10	267.00	266.45	264.10	260.55	264.60	267.40	267.75	267.10
25.....	267.15	267.00	267.25	266.95	267.45	268.35	264.70	260.85	264.15	267.40	267.55	267.05
26.....	267.15	266.90	267.20	267.10	267.05	267.45	263.95	260.95	264.05	267.50	267.60	267.00
27.....	267.05	266.90	267.50	267.45	267.30	265.50	264.05	261.40	263.55	267.30	267.40	267.25
28.....	267.10	267.05	267.60	267.35	267.25	264.30	263.00	261.10	266.45	267.30	267.35	267.35
29.....	267.05	267.25	267.10	267.40	267.30	263.25	262.85	.....	265.60	267.45	267.10	267.35
30.....	266.60	267.30	267.05	267.60	267.10	262.70	262.60	.....	265.05	267.45	267.35	267.00
31.....	267.15	267.05	.....	270.10	.....	262.60	262.40	.....	264.95	.....	267.35	.....

MOHAWK RIVER AT SCHENECTADY

Gage No. 139

This station, established April 3, 1904, is located at the Washington avenue bridge over the Mohawk river between Schenectady and Scotia, commonly known as the Scotia bridge. The original staff gage, secured to the downstream end of the first pier from the east bank, was replaced on April 12, 1917, by a standard Type A gage, No. 139, in the same location, having a range of 24 feet, between elevations 208.0 and 232.0. A standard benchmark plug is set near the gage at elevation 220.0 (B. C. datum).

The gage is read twice daily — A. M. and P. M. — to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT SCHENECTADY for the year ended June 30, 1919. Peter Lebeis, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	212.0	211.55	211.55	211.85	213.85	212.2	212.2	212.0	212.45	208.8	211.9	211.8
2.....	212.1	211.55	211.55	211.85	212.85	211.6	212.75	211.9	213.5	208.4	212.3	211.85
3.....	211.85	211.55	211.5	211.9	212.5	212.1	213.75	211.9	212.9	208.4	212.75	211.65
4.....	211.65	211.55	211.55	212.0	212.55	211.9	212.8	211.9	212.65	208.7	212.3	211.85
5.....	211.7	211.6	211.6	212.0	212.3	211.7	213.0	211.95	212.75	209.95	212.6	211.8
6.....	211.7	211.6	211.6	211.8	212.0	d	212.3	211.95	212.85	212.0	212.5	211.75
7.....	211.55	211.55	211.75	212.35	211.95	d	212.3	211.9	212.45	212.6	212.5	211.85
8.....	211.55	211.7	211.5	212.3	212.15	d	212.3	211.85	212.2	212.75	212.7	211.8
9.....	211.6	211.5	211.5	211.85	211.9	d	212.5	211.8	212.2	212.6	212.45	211.7
10.....	211.8	211.75	211.6	212.0	212.0	d	212.15	211.8	213.9	212.8	212.5	211.7
11.....	211.8	211.55	211.55	211.95	211.7	d	212.2	211.8	213.3	213.2	214.15	211.75
12.....	211.85	211.7	211.55	211.6	211.9	d	212.0	211.8	212.7	215.85	214.1	211.65
13.....	211.85	211.5	211.8	211.75	211.9	d	212.0	211.8	212.6	215.8	214.3	211.65
14.....	211.9	211.65	211.55	211.8	211.7	d	211.9	211.8	212.55	214.3	213.05	211.6
15.....	212.15	211.6	211.65	211.8	211.6	212.35	212.0	211.9	212.45	212.7	212.6	211.85
16.....	211.9	211.6	211.5	211.85	211.8	213.55	212.15	212.1	212.15	210.6	212.45	211.9
17.....	211.9	211.5	211.7	211.8	211.8	212.15	212.1	212.0	212.35	211.0	212.75	211.9
18.....	211.9	211.65	211.8	211.75	212.35	d	212.1	211.9	213.65	213.25	213.0	211.75
19.....	211.85	211.5	211.8	211.7	212.45	d	212.1	211.8	213.75	212.75	213.3	211.7
20.....	211.7	211.65	211.9	211.65	212.6	212.25	212.0	211.8	213.15	212.35	212.45	211.6
21.....	211.75	211.5	212.0	213.05	212.3	212.15	212.05	211.8	213.3	212.4	212.45	211.7
22.....	211.7	211.5	211.8	212.45	212.2	212.0	212.1	211.8	213.35	212.3	212.55	211.6
23.....	211.6	211.5	211.6	212.15	212.3	212.65	212.0	211.8	213.0	212.45	212.85	211.6
24.....	211.6	211.65	211.75	211.9	211.9	213.45	212.1	211.75	212.45	212.3	212.85	211.6
25.....	211.7	211.5	211.8	211.8	212.2	214.8	212.7	211.8	212.6	212.15	212.75	211.65
26.....	211.65	211.5	212.8	212.2	211.8	214.3	212.5	211.8	212.3	212.3	212.65	211.5
27.....	211.6	211.6	213.0	212.5	211.95	213.15	212.35	211.85	209.6	212.2	212.55	211.6
28.....	211.6	211.6	212.65	212.25	211.95	212.6	212.3	211.9	211.8	212.05	212.15	211.6
29.....	211.65	211.6	212.0	212.2	211.85	212.3	212.2	.....	212.2	212.3	211.95	211.6
30.....	211.55	211.6	211.85	212.35	212.15	212.1	212.1	.....	209.35	212.2	211.95	211.6
31.....	211.65	211.7	.....	215.25	.....	212.2	213.05	.....	209.4	.....	211.7	.....

d Records doubtful.

MOHAWK RIVER AT REXFORD

Gage No. 138

This station, originally established by the United States Deep Waterways Commission December 8, 1898, and now maintained by this Department, is located on the Mohawk river at Rexford

(Aqueduct) about 3.7 miles below the N. Y. C. R. R. bridge at Schenectady. Previous to January 20, 1915, a chain gage was located on the right, or south abutment, a few feet above the crest of the old State dam. Beginning January 20, 1915, a staff gage on the upstream side of the south abutment of the old Erie canal aqueduct 800 feet below the dam was used. On January 24, 1917, this gage was replaced by a standard Type A gage, No. 138, at the same location, having a range of 20 feet, between elevations 210.0 and 230.0 A standard bench-mark plug is set near the gage at elevation 216.0 (B. C. datum).

The old State dam with crest at elevation 209.5 has been entirely removed.

The gage is read twice daily — usually at 8 A. M. and 4 P. M.— to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT CANAL AQUEDUCT, REXFORD, for the year ended June 30, 1919. J. Reepmeyer, Jr., Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1....	211.6	211.4	211.3	211.6	212.0	212.0	212.0	212.0	212.45	a	212.1	211.4
2....	211.6	211.4	211.4	211.6	212.0	212.0	212.2	212.0	212.7	a	212.1	211.4
3....	211.6	211.4	211.4	211.8	212.6	211.7	212.05	212.0	212.55	a	212.1	211.3
4....	211.7	211.4	211.3	212.2	211.3	212.0	212.0	212.0	212.35	a	212.3	211.3
5....	211.6	211.4	211.3	212.2	212.0	211.0	212.0	212.0	212.3	a	212.3	211.3
6....	211.6	211.4	211.3	212.2	211.8	211.0	212.0	212.0	212.3	a	212.25	211.3
7....	211.6	211.4	211.3	212.1	211.8	211.0	212.0	212.0	212.1	211.6	212.3	211.3
8....	211.6	211.4	211.4	212.0	211.8	211.0	212.0	212.0	212.0	211.45	212.25	211.3
9....	211.6	211.4	211.4	211.9	211.8	211.0	212.0	212.0	212.3	211.4	212.3	211.35
10....	211.5	211.3	211.4	211.9	211.8	211.0	212.0	212.0	212.4	211.4	212.3	211.35
11....	211.5	211.4	211.4	211.9	211.8	211.0	212.0	212.0	212.4	212.65	212.7	211.4
12....	211.5	211.4	211.4	211.9	211.8	211.0	212.0	212.0	212.6	214.55	212.25	211.45
13....	211.5	211.4	211.6	212.0	211.8	211.2	212.0	212.0	212.6	212.0	212.9	211.4
14....	211.5	211.4	211.5	212.1	211.8	211.9	212.0	212.0	212.8	211.8	212.5	211.4
15....	211.5	211.4	211.5	212.2	211.8	212.0	212.0	212.0	212.85	211.45	212.2	211.4
16....	211.55	211.4	211.5	212.2	211.8	212.0	212.0	212.0	212.6	211.0	212.3	211.4
17....	211.8	211.4	211.5	212.3	212.0	212.0	212.0	212.0	212.4	211.3	212.3	211.4
18....	211.6	211.2	211.5	212.2	212.2	212.0	212.0	212.0	212.35	211.2	212.0	211.4
19....	211.5	211.2	211.5	212.2	212.35	212.0	212.0	212.0	212.25	211.2	212.0	211.3
20....	211.5	211.2	211.5	212.75	212.3	212.0	212.0	212.0	212.2	212.2	212.0	211.3
21....	211.5	211.2	211.5	212.25	212.2	212.0	212.0	212.0	212.0	212.2	212.0	211.4
22....	211.4	211.2	211.5	212.1	212.0	212.0	212.0	212.0	212.0	212.2	212.0	211.3
23....	211.4	211.2	211.5	211.8	212.1	212.2	212.05	212.0	212.0	212.2	212.65	211.3
24....	211.45	211.2	211.55	211.5	212.0	212.6	212.3	212.0	211.7	212.2	212.9	211.3
25....	211.4	211.2	211.6	211.5	212.0	212.9	212.3	212.0	211.4	212.3	212.7	211.2
26....	211.4	211.2	211.8	211.55	212.0	212.9	212.0	212.0	211.1	212.2	212.5	211.2
27....	211.4	211.2	212.6	211.6	212.0	212.35	212.0	212.0	211.0	212.2	212.1	211.2
28....	211.4	211.2	212.15	211.6	212.0	212.1	212.0	212.0	211.0	212.2	212.0	211.2
29....	211.4	211.2	211.8	211.6	212.0	212.0	212.0	212.0	211.0	212.2	212.0	211.2
30....	211.4	211.2	211.8	211.9	212.0	212.0	212.0	212.0	211.0	212.1	211.7	211.2
31....	211.4	211.2	.....	212.7	.....	212.0	212.0	212.0	211.0	.....	211.4	.....

a No record.

MOHAWK RIVER ABOVE VISCHER FERRY DAM

Gage No. 137

This station was established June 24, 1913, by the U. S. Geological Survey and until March 1, 1915, gage heights, or elevations converted from automatic gage records, were published. Since March 1, 1915, a record has been kept by this Department in addition to that of the U. S. Geological Survey. The concrete gage at the upper end of lock No. 7 has been used for this purpose.

The gage is read four times daily to tenths, the hundredths in the table being due to the averaging of the readings.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE VISCHER FERRY DAM, for the year ended June 30, 1919. J. J. Hannan, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	211.68	211.55	211.78	211.78	213.08	212.02	212.08	211.92	212.15	205.58	211.92	211.80
2.....	212.05	211.52	211.55	211.82	212.55	211.80	212.58	211.80	212.73	204.20	212.08	211.65
3.....	211.70	211.50	211.58	211.75	212.32	211.88	212.98	211.70	212.55	203.10	212.30	211.75
4.....	211.72	211.52	211.58	211.82	212.32	211.80	212.58	211.80	212.40	203.75	212.18	211.65
5.....	211.68	211.52	211.55	211.88	212.18	211.85	212.30	211.90	212.33	206.68	212.32	211.70
6.....	211.68	211.48	211.62	211.80	212.10	211.80	212.05	211.80	212.50	209.65	212.35	211.62
7.....	211.65	211.45	211.72	212.20	211.98	211.85	211.98	211.80	212.28	211.30	212.20	211.72
8.....	211.62	211.70	211.55	212.30	211.92	211.98	211.92	211.70	212.05	211.38	212.35	211.68
9.....	211.62	211.55	211.52	212.05	211.88	212.05	212.07	211.70	212.00	211.22	212.20	211.68
10.....	211.70	211.70	211.52	211.88	211.75	212.20	211.97	211.70	212.90	211.48	212.20	211.75
11.....	211.88	211.80	211.52	211.80	211.78	212.18	211.90	211.70	212.70	211.60	212.85	211.68
12.....	211.75	211.58	211.55	211.80	211.78	212.25	211.80	211.70	212.40	212.55	213.05	211.70
13.....	211.80	211.58	211.55	211.72	211.78	212.18	211.73	211.70	212.30	212.92	213.12	211.65
14.....	211.85	211.52	211.68	211.72	211.78	212.08	211.77	211.70	212.30	212.30	212.72	211.60
15.....	212.02	211.60	211.65	211.72	211.90	212.47	211.80	211.80	212.18	211.52	212.38	211.72
16.....	212.02	211.55	211.55	211.72	211.77	212.85	212.00	212.00	212.00	209.38	212.20	211.82
17.....	211.80	211.52	211.55	211.78	211.72	212.22	212.00	211.90	212.10	208.75	212.20	211.98
18.....	211.75	211.50	211.82	211.73	211.90	209.08	211.93	211.80	212.72	212.55	212.45	211.80
19.....	211.75	211.50	211.82	211.68	212.42	204.62	211.92	211.70	212.92	212.40	212.68	211.60
20.....	211.82	211.50	211.80	211.65	212.35	211.60	211.92	211.70	212.60	212.38	212.38	211.60
21.....	211.70	211.50	211.88	212.45	212.22	211.98	211.90	211.77	212.65	212.20	212.28	211.60
22.....	211.60	211.50	211.95	212.28	212.00	211.98	211.90	211.70	212.75	212.20	212.12	211.60
23.....	211.65	211.50	211.72	211.95	212.10	212.12	211.92	211.70	212.53	212.15	212.38	211.60
24.....	211.68	211.48	211.88	211.72	211.95	212.82	212.02	211.70	212.32	212.02	212.45	211.60
25.....	211.62	211.55	211.75	211.78	211.90	213.10	212.18	211.70	212.00	211.95	212.42	211.58
26.....	211.58	211.50	212.20	212.12	211.95	213.20	212.23	211.80	211.62	212.12	212.45	211.55
27.....	211.55	211.48	212.68	212.42	211.92	212.62	212.12	211.85	209.82	212.10	212.12	211.60
28.....	211.60	211.48	212.35	212.05	211.90	212.42	212.10	211.85	209.75	211.96	212.12	211.58
29.....	211.58	211.50	211.95	211.98	211.75	212.18	212.00	.....	211.50	212.10	211.95	211.62
30.....	211.60	211.48	211.90	211.92	211.85	212.02	212.00	.....	206.50	212.10	211.82	211.60
31.....	211.60	211.58	.....	213.20	.....	211.95	212.00	.....	206.10	.....	211.75	.....

MOHAWK RIVER BELOW VISCHER FERRY DAM

Gage No. 136

This station, established May 1, 1916, is located below the Vischer Ferry dam on the Mohawk river and indicates the water-surface at the upstream end of the canalized pool formed by the Crescent dam. The vertical staff concrete gage on the lower end of Barge canal lock No. 7 is read four times daily to tenths, the hundredths in the table being due to the averaging of the readings.

Daily elevation of water-surfaces (B. C. datum) of MOHAWK RIVER BELOW VISCHER FERRY DAM, for the year ended June 30, 1919. J. J. HANSON, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	184.70	184.48	184.72	184.88	186.28	184.95	185.15	185.08	185.18	185.62	185.12	184.85
2.....	185.18	184.48	184.48	184.85	185.72	184.85	185.62	184.85	186.30	185.38	185.25	184.88
3.....	184.80	184.40	184.50	184.78	185.58	184.90	186.30	184.80	185.88	185.30	185.42	184.82
4.....	184.80	184.48	184.45	184.95	185.50	184.98	185.92	184.80	185.62	185.42	185.38	184.80
5.....	184.70	184.50	184.48	185.00	185.30	184.92	185.60	184.80	185.50	185.75	185.50	184.88
6.....	184.72	184.40	184.58	184.90	185.18	184.82	185.35	184.80	185.72	186.05	185.52	184.70
7.....	184.68	184.42	184.72	185.35	185.15	184.88	185.20	184.80	185.60	186.25	185.38	184.82
8.....	184.60	184.70	184.65	185.45	185.00	185.05	185.18	184.70	185.22	186.30	185.50	184.80
9.....	184.60	184.62	184.50	185.12	185.02	185.05	185.10	184.70	185.13	186.30	185.32	184.72
10.....	184.70	184.88	184.50	185.05	184.95	185.18	184.93	184.70	186.20	186.35	185.30	184.78
11.....	184.92	184.72	184.50	184.93	184.88	185.22	184.83	184.70	186.03	186.40	186.08	184.72
12.....	184.82	184.52	184.52	184.72	184.80	185.30	184.80	184.60	185.70	187.25	186.55	184.70
13.....	184.82	184.65	184.58	184.85	184.82	185.22	184.80	184.60	185.60	187.85	186.68	184.70
14.....	184.95	184.50	184.80	184.72	184.80	185.20	184.93	184.60	185.42	187.18	186.12	184.70
15.....	185.05	184.72	184.68	184.82	184.80	185.53	185.00	184.80	185.28	186.42	185.70	184.70
16.....	185.12	184.58	184.60	184.78	184.80	185.98	185.10	185.00	185.20	186.02	185.35	184.90
17.....	184.88	184.50	184.60	184.78	184.85	185.78	185.10	184.90	185.25	185.58	185.28	185.00
18.....	184.85	184.50	184.75	184.77	184.95	185.78	185.10	184.80	185.95	185.88	185.00	184.88
19.....	184.88	184.45	184.85	184.70	185.45	185.48	185.08	184.80	186.42	185.62	185.78	184.62
20.....	184.85	184.40	184.80	184.70	185.52	184.85	184.88	184.70	185.92	185.55	185.62	184.60
21.....	184.70	184.40	184.88	185.45	185.25	185.12	184.92	184.70	185.90	185.30	185.40	184.60
22.....	184.60	184.40	184.95	185.38	185.18	185.08	184.98	184.70	186.08	185.25	185.32	184.60
23.....	184.70	184.40	184.88	185.15	185.08	185.12	185.00	184.70	186.80	185.25	185.40	184.60
24.....	184.70	184.45	184.92	184.92	185.10	186.15	185.12	184.70	185.58	185.10	185.60	184.60
25.....	184.70	184.45	184.80	184.98	184.95	186.92	185.28	184.70	185.50	185.10	185.45	184.60
26.....	184.62	184.38	185.15	185.05	185.02	187.15	185.30	184.80	185.38	185.15	185.00	184.60
27.....	184.55	184.42	185.85	185.48	185.02	186.10	185.25	184.82	185.38	185.15	185.38	184.90
28.....	184.55	184.42	185.42	185.15	184.95	185.72	185.20	184.82	185.40	184.93	185.28	184.65
29.....	184.60	184.48	185.10	185.05	184.80	185.45	185.02	.....	186.20	185.20	185.08	184.60
30.....	184.55	184.40	184.88	184.92	185.05	185.22	185.10	.....	185.77	185.20	184.98	184.60
31.....	184.50	184.45	.....	186.48	.....	185.08	185.10	.....	185.60	.....	184.88	.....

MOHAWK RIVER AT VISCHER FERRY DAM

Location.—At Vischer Ferry dam of the Barge canal (lock No. 7), 1 mile above Stony Creek and Vischer Ferry, about 7 miles below Schenectady, Schenectady county, and about 11 miles above the mouth.

Drainage area.—3,400 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—June 24, 1913, to June 30, 1919.

Gage.—Stevens water-stage recorder (showing head on crest of spillway), in the southerly corner of the basin near upper end of Barge canal lock; installed August 18, 1916.

Staff gage in masonry of outer lock wall, just above upper gates, read March 30 to May 23, 1914, and March 30 to August 17, 1916. Datum of gage 12.1 feet lower than that of recorder.

Water-gage recorders inspected by engineers from the Albany office of the United States Geological Survey. Staff gage read by lock-tenders.

Channel and control.—The control is the crest of the spillway.

Extremes of discharge.—Current year: Maximum stage* not determined at this station. Minimum stage from water-stage recorder, 0.21 foot at 10 A. M., December 3; discharge, 380 second-feet.

1913–1919: Maximum stage recorded, 7.6 feet just before noon, March 28, 1914, determined by leveling from flood marks; discharge, not determined. Minimum stage from water-stage recorder, 0.18 foot from 4 A. M. to 5 A. M. and 4 P. M. to 6 P. M., October 31, 1914; discharge, about 290 second-feet.

Diversions.—Barge canal lock No. 7, at the south end of dam, was put in operation May 15, 1915. The following tables of discharge include the flow over the spillway and through the lock and water-wheels.

Regulation.—Flow affected by operation of dams upstream.

Accuracy.—Stage-discharge relation practically permanent. Probably not affected by ice. Rating curve well defined by discharge measurements between 350 and 2,500 second-feet; above 2,500 second-feet, based on theoretic coefficients. Gage in lock

*Waste-gates in dam open during spring floods. See record at Crescent dam for maximum flow.

read to tenths twice daily, January 29 to March 23; operation of water-stage recorder satisfactory for the remainder of year. Daily discharge ascertained from staff gage record by applying mean daily gage height to rating table; daily discharge for remainder of year determined by use of discharge integrator. Records fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Daily discharge, in second-feet, of MOHAWK RIVER AT VISCHER FERRY DAM, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2,490	1,080	2,700	3,090	15,300	3,890	4,750	3,420	6,870	9,530	4,380	2,980
2.....	4,800	1,260	1,750	2,880	10,500	2,900	9,570	2,580	12,400	8,480	6,340	2,380
3.....	2,690	1,510	1,600	2,790	7,530	2,970	13,200	2,310	9,900	7,920	9,020	2,300
4.....	2,490	1,490	1,820	3,640	7,230	3,400	9,020	3,540	8,520	8,480	6,520	1,820
5.....	1,950	1,450	1,680	3,790	5,630	3,580	6,250	3,620	8,620	10,700	8,630	2,260
6.....	2,700	1,510	1,940	2,950	4,290	4,520	4,680	3,460	9,350	13,200	8,120	1,780
7.....	2,130	1,530	2,520	6,750	4,330	3,740	4,390	3,380	7,020	14,600	7,260	2,180
8.....	1,680	2,730	1,260	6,720	3,910	4,100	4,110	3,080	5,390	15,000	8,620	2,030
9.....	1,950	1,490	1,180	4,190	3,230	5,230	5,170	2,740	5,920	14,300	7,160	1,860
10.....	2,280	3,570	1,110	4,200	4,170	6,770	4,250	2,430	14,000	15,500	7,280	1,940
11.....	3,030	2,490	1,320	3,290	3,010	6,700	3,170	2,340	12,300	16,700	15,000	1,770
12.....	2,610	1,650	1,890	2,430	3,390	6,500	2,580	2,090	8,820	25,400	16,800	1,960
13.....	3,040	1,640	2,490	2,720	3,300	5,610	2,410	2,250	7,720	28,300	17,900	1,430
14.....	3,600	1,380	2,640	2,380	3,270	5,330	2,810	2,410	7,420	21,500	12,300	1,380
15.....	5,180	1,600	2,540	2,780	2,530	9,900	3,550	3,540	5,930	15,500	9,130	2,050
16.....	5,240	1,240	2,270	2,720	3,000	13,100	4,050	4,760	4,940	12,800	7,260	3,280
17.....	2,950	1,350	1,790	2,580	2,720	7,960	4,110	3,670	6,460	9,490	6,400	3,320
18.....	3,350	1,080	3,420	2,590	5,410	8,800	3,860	3,050	13,600	10,200	10,000	2,690
19.....	3,040	980	2,880	2,380	7,490	4,350	3,860	2,810	14,600	8,900	12,100	1,940
20.....	2,440	1,120	2,960	2,150	7,840	3,080	3,800	2,410	11,200	7,060	7,880	2,050
21.....	2,350	1,320	3,830	9,190	6,460	4,490	3,800	2,660	11,700	5,800	7,210	1,870
22.....	1,820	1,260	3,780	6,840	5,400	4,340	3,800	2,580	11,800	5,420	6,700	1,860
23.....	2,180	1,140	2,560	4,940	5,280	7,470	3,800	2,660	10,000	4,770	8,410	1,770
24.....	1,650	1,130	3,620	3,790	3,980	12,300	4,960	2,580	8,520	5,370	8,650	1,580
25.....	1,710	1,160	2,910	3,250	4,780	16,800	6,250	2,740	7,320	5,460	8,820	1,340
26.....	1,480	1,210	7,360	4,320	4,170	17,700	6,470	3,380	9,100	5,630	8,400	1,240
27.....	1,420	1,020	10,700	8,110	3,470	11,500	5,380	3,380	8,440	5,270	6,520	1,500
28.....	1,250	1,000	7,270	5,670	3,450	8,160	4,820	3,460	9,660	5,140	5,820	1,760
29.....	1,160	1,180	4,280	5,070	3,120	5,890	4,470	.....	14,200	6,040	4,330	2,530
30.....	1,180	1,300	3,400	5,200	4,520	4,490	4,110	.....	11,500	6,940	4,110	2,020
31.....	1,020	1,830	.....	20,100	.....	4,340	3,800	.....	10,300	.....	2,930	.....
Mean...	2,480	1,470	3,040	4,630	5,090	6,770	4,880	2,980	9,470	10,900	8,390	2,030

NOTE.—Discharge, August 12 to 19, August 26 to September 6, September 13 to 16 and 27 to 30, November 27 to 30, December 1 to 14 and 18 to 31, January 1 to 31, February 1 to 3, 12 to 14 and 17 to 20, March 26 to 31, April 1 to 17, and June 21 to 28, taken from record at Crescent dam, because of no record at Vischer Ferry.

Monthly discharge of MOHAWK RIVER AT VISCHER FERRY DAM, for the year ended
June 30, 1919

[Drainage area, 3,400 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	5,240	1,020	2,480	0.723	0.83
August.....	3,570	980	1,470	0.429	0.49
September.....	10,700	1,110	3,040	0.886	0.99
October.....	20,100	2,150	4,630	1.36	1.57
November.....	15,300	2,530	5,090	1.49	1.66
December.....	17,700	2,900	6,770	1.99	2.29
January.....	13,200	2,410	4,880	1.43	1.65
February.....	4,760	2,090	2,980	0.874	0.91
March.....	14,600	4,940	9,470	2.78	3.20
April.....	28,300	4,770	10,900	3.20	3.57
May.....	17,900	2,930	8,390	2.46	2.84
June.....	3,320	1,240	2,030	0.595	0.66
The year.....	28,300	980	5,178	1.52	20.66

MOHAWK RIVER AT DUNSBACK FERRY

Gage No. 135

This station, maintained March 12, 1898, to April 1, 1899, by the United States Deep Waterways Commission, was reestablished August 1, 1900, by the United States Geological Survey in coöperation with this Department and is now maintained by this Department. It is located at the Watervliet pumping station on the right, or south, bank of the Mohawk river at the site of the old Dunsbach Ferry dam, about 3 miles above the old Erie canal aqueduct at the village of Crescent, about 5.6 miles below the new Vischer Ferry dam and about 4.6 miles above the new Crescent dam. Discharge computations were discontinued in 1911 and the old dam was partially removed in August, 1912.

The original gage was a staff in three sections, having a range of 17 feet, the lower two sections, from 2.0 to 9.0, being secured to crib work, and the upper sections, from 9.0 to 19.0, being secured to the wall of the pump-house. Reference points were used from October 22, 1914, to March 6, 1916, when a staff gage was erected. This was replaced on January 16, 1917, by a standard Type A gage, No. 135, secured to the northwest corner of the Watervliet Hydraulic Company's pump-house and having

a range of 12.0 feet, between elevations 183.0 and 195.0. A standard bench-mark plug is set near the gage at elevation 190.0 (B. C. datum).

The gage is read twice daily—at 8 A. M. and 4 P. M.—to tenths.

Emendation.—Owing to transposition of figures the elevation of the reference point on the door-sill has been used as 191.12 instead of 191.21. All elevations from October 15, 1912, to March 5, 1916, inclusive, should be 0.09 higher.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT DUNSBACH FERRY, for the year ended June 30, 1919. Robert Wilson, Observer

DAY	July	Aug.	DAY	July	Aug.	DAY	July	Aug.
1.....	185.7	184.4	11.....	184.85	.....	21.....	184.75	.....
2.....	185.5	.....	12.....	184.8	.....	22.....	184.7	.....
3.....	185.5	.....	13.....	184.8	.....	23.....	184.6	.....
4.....	185.6	.....	14.....	184.8	.....	24.....	184.6	.....
5.....	185.55	.....	15.....	184.8	.....	25.....	184.55	.....
6.....	185.5	.....	16.....	184.9	.....	26.....	184.5	.....
7.....	185.4	.....	17.....	184.95	.....	27.....	184.5	.....
8.....	185.2	.....	18.....	184.95	.....	28.....	184.5	.....
9.....	185.05	.....	19.....	184.85	.....	29.....	184.5	.....
10.....	184.9	.....	20.....	184.8	.....	30.....	184.5	.....
						31.....	184.4	.....

NOTE.—Station discontinued August 2, 1918.

MOHAWK RIVER ABOVE CRESCENT DAM, NEAR COHOES

Gage No. 134

This station, established October 22, 1916, is located above Crescent dam, in the guard-gate by-pass at the entrance to the land-line between Crescent dam and Waterford. The gage, No. 134, is a standard Type A gage, secured to the north side of the pier between the guard-gate and by-pass just above the Taintor gate, and has a range of 12 feet, between elevations 182.0 and 194.0.

The gage is read twice daily—at 6 A. M. and 6 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE CRESCENT DAM, NEAR COHOES, for the year ended June 30, 1919. Ed. M. Powers, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	184.65	184.40	184.65	184.70	186.45	184.95	185.05	184.90	184.80	185.60	185.20	184.80
2.....	185.05	184.40	184.50	184.80	185.80	184.75	185.60	184.80	186.00	185.50	185.20	184.70
3.....	184.70	184.40	184.50	184.70	186.45	184.90	186.15	184.80	185.80	185.40	185.40	184.80
4.....	184.75	184.50	184.45	184.90	185.25	184.90	185.70	184.80	185.60	185.00	185.30	184.70
5.....	184.55	184.50	184.45	184.90	185.25	184.80	185.30	184.80	185.50	185.75	185.60	184.75
6.....	184.70	184.50	184.50	184.80	185.10	184.95	185.05	184.80	185.50	185.95	185.55	184.70
7.....	184.60	184.50	184.75	185.35	185.10	184.90	184.85	184.80	185.50	186.10	185.35	184.75
8.....	184.50	184.50	184.45	185.15	185.00	185.05	184.80	184.80	185.20	186.15	185.55	184.70
9.....	184.60	184.80	184.45	185.00	184.90	185.05	184.85	184.80	185.10	186.05	185.35	184.70
10.....	184.60	184.80	184.40	185.00	184.90	185.30	184.75	184.80	186.00	186.20	185.30	184.65
11.....	184.80	184.80	184.55	184.85	184.80	185.40	184.65	184.70	186.00	186.30	186.00	184.60
12.....	184.75	184.55	184.50	184.70	184.80	185.30	184.50	184.70	186.00	187.00	186.40	184.60
13.....	184.75	184.60	184.55	184.60	184.80	185.20	184.50	184.70	185.40	187.40	186.40	184.60
14.....	184.85	184.50	184.70	184.65	184.85	185.20	184.50	184.75	185.40	186.80	185.90	184.60
15.....	185.05	184.45	184.70	184.85	184.80	185.40	184.50	184.80	185.20	186.20	185.60	184.70
16.....	185.15	184.50	184.55	184.75	184.80	186.05	184.50	185.00	185.15	185.95	185.50	184.85
17.....	184.70	184.50	184.60	184.70	184.80	185.80	184.90	185.00	185.20	185.55	185.35	184.85
18.....	184.75	184.50	184.80	184.70	185.05	185.65	184.95	185.00	186.00	186.85	185.65	184.85
19.....	184.85	184.50	184.90	184.65	185.45	185.05	185.00	184.90	186.25	185.65	185.95	184.55
20.....	184.75	184.40	184.80	184.60	185.45	184.85	185.00	184.85	185.85	185.40	185.70	184.60
21.....	184.70	184.35	184.85	185.55	185.25	185.10	185.00	184.80	185.85	185.30	185.40	184.60
22.....	184.50	184.50	184.90	185.35	185.15	185.00	184.95	184.80	185.90	185.20	185.30	184.60
23.....	184.70	184.50	184.75	185.10	185.20	185.15	184.95	184.80	185.75	185.10	185.50	184.55
24.....	184.60	184.50	184.90	184.95	185.00	186.00	185.00	184.80	185.50	185.20	185.70	184.50
25.....	184.55	184.50	184.80	184.90	184.80	186.40	185.15	184.80	185.50	185.20	185.65	184.50
26.....	184.55	184.50	185.20	184.95	185.00	186.60	185.30	184.80	185.50	185.25	185.60	184.50
27.....	184.55	184.50	185.80	185.40	184.85	185.90	185.15	184.80	185.45	185.20	185.35	184.55
28.....	184.50	184.50	185.10	185.15	184.75	185.65	185.10	184.60	185.50	185.10	185.20	184.50
29.....	184.50	184.50	184.90	185.05	184.80	185.30	185.10	.....	186.10	185.00	185.10	a
30.....	184.50	184.50	184.95	184.90	185.05	185.10	185.05	.....	185.85	185.15	184.90	a
31.....	184.40	184.50	.....	186.10	.....	185.05	185.00	.....	185.65	.....	184.75	.....

a No record.

MOHAWK RIVER BELOW CRESCENT DAM, NEAR COHOES

Gage No. 133

This station, established October 22, 1916, is located below Crescent dam, at the power-house. The gage, No. 133, is a standard Type A gage, secured to the southwest corner of the power-house, and has a range of 16 feet, between elevations 157.0 and 173.0.

The gage is read twice daily—at 6 A. M. and 6 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER BELOW CRESCENT DAM, NEAR COHOES, for the year ended June 30, 1919. Ed. M. Powers, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	156.15	155.7	157.5	157.4	159.1	157.7	157.95	157.6	157.5	158.4	158.0	157.6
2.....	157.75	155.65	157.4	157.45	158.65	157.25	158.35	157.5	158.8	158.2	158.0	157.4
3.....	157.45	157.25	155.7	157.5	158.45	157.55	158.9	157.6	158.6	158.1	158.2	157.45
4.....	157.6	157.35	155.7	157.7	158.15	157.45	158.45	157.5	158.3	158.15	158.1	157.35
5.....	157.15	155.85	155.65	157.7	158.1	157.55	158.2	157.5	158.3	158.5	158.4	157.45
6.....	157.5	155.5	157.2	157.65	157.85	157.7	157.8	157.5	158.3	158.75	158.3	157.4
7.....	157.45	157.25	157.5	158.15	157.8	157.7	157.7	157.5	158.3	158.9	158.15	157.4
8.....	156.15	157.4	157.4	158.0	157.6	157.9	157.6	157.5	157.9	158.9	158.25	157.5
9.....	157.35	157.2	155.85	157.6	157.65	157.6	157.75	157.6	157.7	158.8	158.1	157.5
10.....	157.3	157.6	155.75	157.65	158.25	157.95	157.5	157.6	158.6	158.95	158.0	157.3
11.....	157.6	157.55	156.3	157.5	157.6	157.95	157.55	157.5	158.8	159.0	158.8	157.1
12.....	157.5	156.3	155.7	157.4	157.65	157.95	157.3	157.5	158.8	159.75	159.2	157.25
13.....	157.55	156.6	156.65	157.4	157.35	157.8	157.3	157.5	158.2	160.15	159.15	157.1
14.....	157.65	156.55	157.6	157.4	157.45	157.95	157.3	157.5	158.0	159.55	158.65	157.1
15.....	157.9	156.95	157.5	157.55	156.65	158.2	157.3	157.6	158.0	158.9	158.35	157.5
16.....	157.8	155.85	155.8	157.5	157.45	158.8	157.3	157.7	157.9	158.65	158.3	157.55
17.....	157.5	157.35	155.55	157.3	157.7	158.55	157.7	157.6	157.9	158.35	158.1	157.6
18.....	157.5	157.3	156.05	157.35	157.75	158.45	157.7	157.6	158.75	158.6	158.45	157.6
19.....	157.55	155.85	157.5	157.45	158.25	157.75	157.8	157.6	159.0	158.4	158.65	157.3
20.....	157.55	155.8	157.4	157.45	158.15	157.3	157.8	157.55	158.6	158.2	158.25	157.3
21.....	157.5	155.75	157.55	158.2	158.1	157.8	157.8	157.5	158.6	158.05	158.1	157.3
22.....	156.0	157.3	157.6	158.15	157.85	157.85	157.75	157.5	158.75	157.9	158.0	157.4
23.....	157.3	157.3	157.6	157.75	157.9	157.8	157.75	157.5	158.6	157.7	158.2	156.45
24.....	157.3	157.3	157.5	157.55	157.8	158.8	157.8	157.5	158.2	157.8	158.5	156.65
25.....	156.2	157.4	156.6	157.45	157.6	159.25	157.9	157.5	158.2	157.85	158.45	156.45
26.....	156.1	157.4	157.75	157.7	157.75	159.4	158.0	157.5	158.2	158.05	158.35	156.55
27.....	157.3	157.35	158.65	158.3	157.5	158.6	157.8	157.5	158.2	158.0	158.05	156.9
28.....	157.3	157.3	158.15	157.85	157.55	158.4	157.75	157.5	158.2	157.85	157.9	157.2
29.....	156.15	157.35	157.7	157.75	157.7	158.15	157.65	.....	158.7	157.7	157.8	a
30.....	155.85	157.3	157.45	157.45	157.95	157.8	157.65	.....	158.65	157.95	157.65	a
31.....	155.55	157.3	.....	158.7	.....	158.25	157.75	.....	158.35	.....	157.5	.....

a No record.

MOHAWK RIVER AT CRESCENT DAM

Location.—At the Crescent dam of the Barge canal, about 3 miles above the mouth of the river at Cohoes.

Drainage area.—3,490 square miles. (Measured on U. S. Geological Survey topographic maps by State Engineer's Department.)

Records available.—December 1, 1917, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder on left bank, about 50 feet above guard-gate at head of Waterford series of locks. It is about 200 yards from left end of spillway. Inspected by operator from Barge canal power-house at the dam.

Determination of discharge.—The rating curve for the spillway has been computed from discharge determined from records at Vischer Ferry and gage heights observed at Crescent. Discharge through the locks and water wheels determined from records of operation of the locks.

Channel and control.—The control is the crest of the spillway.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 7.59 feet at 2 A. M., April 13; discharge 30,100 second-feet. Minimum stage from water-stage recorder, 4.04 feet at 6 A. M., August 21; discharge, zero.

1917-1919: Maximum stage recorded, 7.9 feet at 7 P. M., March 23, 1918; discharge, 38,100 second-feet. Minimum stage recorded, 4.04 feet, August 21, 1918; discharge, zero.

Diversions.—Water is diverted at this point for canal purposes through lock No. 6 and through the power-plant located at the east end of the dam. The following tables of discharge include the flow through lock No. 6 and through the power-plant.

Regulation.—Seasonal distribution of flow regulated by the Delta reservoir on the upper Mohawk and by Hinckley reservoir on West Canada Creek. Large irregular diurnal fluctuations during low water caused by operation of movable dams upstream.

Accuracy.—Stage-discharge relation permanent. Probably not affected by ice. Since rating is based on computation only, its accuracy is indeterminate. Record from water-stage recorder satisfactory. Results probably fairly good for periods of low water and fair for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor. Recorder inspected by an employee of the State Superintendent of Public Works.

Daily discharge, in second-feet, of MOHAWK RIVER AT CRESCENT DAM, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2,100	1,240	2,700	2,860	15,900	3,890	4,750	3,420	6,270	9,530	5,480	3,280
2.....	4,650	1,240	1,750	2,850	10,200	2,900	9,570	2,580	11,900	8,480	7,090	2,960
3.....	2,630	1,300	1,600	2,730	7,620	2,970	13,200	2,810	10,200	7,920	9,500	3,150
4.....	2,790	1,340	1,620	3,640	6,670	3,400	9,020	2,990	8,540	8,490	7,980	2,960
5.....	2,080	1,350	1,660	3,460	5,770	3,580	6,250	3,170	8,540	10,700	9,260	2,920
6.....	2,380	1,260	1,940	2,980	4,720	4,520	4,680	2,990	9,510	13,200	9,180	2,470
7.....	2,110	1,390	2,840	5,400	4,240	3,740	4,390	2,870	7,280	14,600	7,540	2,730
8.....	1,890	2,320	2,240	6,350	3,980	4,100	4,110	2,690	6,660	15,000	8,960	2,470
9.....	1,820	1,390	2,070	4,250	3,460	5,230	5,170	2,470	6,170	14,300	7,590	2,370
10.....	2,090	2,560	1,840	3,950	3,830	6,770	4,250	2,140	14,100	15,500	7,860	2,370
11.....	2,960	1,990	1,420	3,040	3,150	6,700	3,170	2,030	13,200	16,700	14,900	2,170
12.....	2,670	1,650	1,970	2,650	3,140	6,500	2,580	2,090	9,870	25,400	17,000	2,180
13.....	2,890	1,640	2,490	2,510	3,220	5,610	2,410	2,250	8,060	28,300	17,960	1,870
14.....	3,430	1,380	2,640	2,350	3,260	5,330	2,810	2,410	7,740	21,500	18,000	1,630
15.....	4,660	1,600	2,540	2,620	2,790	8,320	3,550	3,050	6,620	15,500	9,430	2,090
16.....	4,920	1,240	2,270	2,510	2,960	12,100	4,050	4,250	5,660	12,800	7,790	3,370
17.....	3,150	1,350	1,980	2,360	2,730	9,890	4,110	3,670	6,380	9,490	7,310	3,480
18.....	3,030	1,060	3,830	2,520	4,890	8,800	3,860	3,050	13,500	12,300	9,700	3,020
19.....	3,270	980	3,700	2,150	7,810	4,350	3,860	2,810	15,700	9,690	12,200	1,850
20.....	2,790	1,090	3,640	2,230	7,660	3,080	3,800	2,410	12,300	8,290	9,280	1,930
21.....	2,380	1,050	3,380	7,530	6,420	4,490	3,800	2,690	12,300	6,840	7,930	1,870
22.....	1,830	1,040	3,890	7,150	5,420	4,340	3,800	2,750	12,500	6,400	7,480	1,860
23.....	2,340	1,040	2,680	4,840	5,220	7,470	3,800	2,690	11,200	5,910	9,430	1,770
24.....	1,990	1,170	3,080	4,080	3,970	12,300	4,960	2,810	9,180	6,340	9,510	1,580
25.....	1,980	1,440	2,710	3,270	4,150	16,800	6,250	2,810	8,700	6,510	8,960	1,340
26.....	1,820	1,210	5,810	3,780	4,150	17,700	6,470	3,490	9,100	6,880	8,780	1,240
27.....	1,700	1,020	10,700	7,260	3,470	11,500	5,380	3,350	8,440	6,700	6,620	1,500
28.....	1,520	1,000	7,270	5,630	3,450	8,160	4,820	3,550	9,660	5,610	6,180	1,760
29.....	1,400	1,180	4,360	4,940	3,130	5,890	4,470	.....	14,200	6,700	4,600	2,040
30.....	1,410	1,300	3,520	4,520	4,520	4,490	4,110	.....	11,500	6,690	3,660	1,780
31.....	1,270	1,830	.....	17,600	.....	4,340	3,890	.....	10,300	.....	2,930	.....
Mean...	2,500	1,380	3,130	4,320	5,060	6,750	4,880	2,850	9,810	11,400	8,870	2,250

NOTE.—Discharge for May 31 taken from Vischer Ferry record.

Monthly discharge of MOHAWK RIVER AT CRESCENT DAM, for the year ended June 30, 1919

[Drainage area, 3,490 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	4,920	1,270	2,500	0.716	0.83
August.....	2,560	980	1,380	0.395	0.46
September.....	10,700	1,420	3,130	0.897	1.00
October.....	17,600	2,150	4,320	1.24	1.43
November.....	15,900	2,730	5,080	1.45	1.62
December.....	17,700	2,900	6,760	1.93	2.22
January.....	13,200	2,410	4,880	1.40	1.61
February.....	4,250	2,030	2,850	0.817	0.85
March.....	15,700	5,660	9,810	2.81	3.24
April.....	28,300	5,610	11,400	3.27	3.65
May.....	17,900	2,930	8,870	2.54	2.93
June.....	3,480	1,240	2,250	0.645	0.72
The year.....	28,300	980	5,267	1.51	20.56

MOHAWK RIVER ABOVE DAM, COHOES

Gage No. 132

This station, established December, 1903, in coöperation with the United States Weather Bureau, but now maintained by this Department, is located above the power dam of the Cohoes Company across the Mohawk river at Cohoes. The pool above this dam extends three-quarters of a mile to the new Crescent dam. The dam has a fixed concrete crest 1,278 feet and 2 inches long at about elevation 157.0, on which flash-boards 3 feet high are maintained during low stages. There is also a 24-foot spillway in the gate-house. Owing to the irregular use of water for power purposes the surface above the dam fluctuates as much as 7 or 8 feet during twenty-four hours.

In October, 1916, a standard Type A gage, No. 132, in two sections, was erected on the breakwater to replace the old gage. The lower section has a range of 8 feet, between elevations 154.0 and 162.0, and the upper section has a range of 4 feet, between elevations 162.0 and 166.0. Standard bench-mark plugs are placed near the gages, for the lower section at elevation 161.0 (B. C. datum) and for the upper section at elevation 163.0 (B. C. datum).

The gage is read twice daily—morning and afternoon—to tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE DAM AT COHOS, for the year ended June 30, 1919. Mrs. Rose Murphy and Antoine Plouffe, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	157.9	157.3	157.55	157.6	157.2	157.8	157.9	157.6	157.9	158.25	157.7	157.65
2.....	157.45	155.7	157.35	157.6	158.55	157.65	157.8	a	158.85	158.2	157.85	157.2
3.....	157.45	157.15	157.3	157.45	158.45	157.45	158.7	a	158.35	157.95	158.3	157.3
4.....	157.6	157.25	155.8	157.7	158.05	157.45	158.3	a	158.15	158.05	158.15	157.2
5.....	157.35	155.95	155.75	157.55	158.1	157.65	158.15	a	158.2	158.45	158.15	157.45
6.....	157.45	155.6	157.15	157.65	158.0	157.7	157.75	a	158.1	158.75	158.15	157.2
7.....	157.4	155.7	157.45	158.0	157.7	157.6	157.6	a	158.1	158.75	157.9	157.5
8.....	157.25	157.5	157.45	158.1	157.65	157.8	157.7	a	157.9	158.7	158.1	157.6
9.....	157.25	156.15	157.45	157.7	157.7	157.8	157.65	a	157.85	158.6	157.9	157.45
10.....	157.3	157.25	155.9	157.7	157.75	157.8	157.75	a	158.3	158.75	158.05	157.2
11.....	157.4	157.5	157.4	157.4	157.7	157.6	157.85	a	158.6	158.9	158.9	156.8
12.....	157.55	156.55	157.45	157.6	157.65	157.55	157.85	a	158.25	159.6	158.9	156.85
13.....	157.55	156.75	155.7	157.4	157.5	157.85	157.35	a	158.0	159.95	158.7	156.85
14.....	157.65	156.45	157.6	157.5	157.45	157.9	157.25	a	158.1	159.3	158.8	157.25
15.....	157.9	156.85	157.35	157.4	157.3	157.9	157.65	a	158.0	158.75	158.2	157.45
16.....	157.95	156.0	155.7	157.4	157.4	158.8	157.6	a	157.9	158.45	158.05	157.5
17.....	157.45	157.35	155.8	157.35	157.6	158.45	157.45	a	157.75	157.9	158.05	157.5
18.....	157.6	157.25	157.6	157.4	157.2	158.15	157.65	a	158.55	158.45	158.2	157.45
19.....	157.3	156.1	157.5	157.35	158.05	157.7	157.85	a	158.8	158.35	158.5	157.1
20.....	157.5	155.9	157.55	157.3	157.8	157.85	157.5	a	158.45	158.2	158.2	156.9
21.....	157.45	155.8	157.6	158.1	157.75	157.9	157.65	a	158.45	157.9	158.0	157.35
22.....	156.25	155.95	157.75	158.15	157.85	157.9	157.6	a	158.6	157.8	157.9	157.4
23.....	157.45	156.85	157.65	157.85	157.8	157.8	157.5	a	158.6	157.75	158.15	156.85
24.....	157.4	157.3	157.5	157.6	157.7	158.6	157.85	a	158.15	157.7	158.45	156.75
25.....	157.4	157.3	157.35	157.5	157.35	159.3	158.2	a	158.1	157.75	158.4	156.5
26.....	157.3	157.35	157.85	157.7	157.45	159.25	159.1	a	158.1	158.0	158.25	156.35
27.....	157.3	157.35	158.55	158.2	157.85	158.95	157.65	a	158.05	158.0	158.0	156.35
28.....	157.3	157.35	158.1	157.7	157.7	158.25	157.65	a	158.2	157.7	157.9	157.25
29.....	156.25	157.35	157.8	157.85	157.1	158.1	157.6	.....	158.75	157.9	157.7	157.45
30.....	155.9	157.25	157.65	157.7	157.35	157.7	157.55	.....	158.55	157.85	157.65	156.65
31.....	155.6	157.25	.....	159.0	.....	157.7	157.5	.....	158.3	.....	158.45	.....

a No record.

MOHAWK RIVER AT WATERFORD

Gage No. 131

This station, established January 15, 1907, is located at Waterford on the most northerly branch of the Mohawk river and indicates its water-surface about 1,000 feet above its entrance to the Hudson river. As most of the flow of the Mohawk passes through the other branches, this gage also indicates closely the surface of the Hudson river at this locality, which is about $21\frac{1}{3}$ miles above the new Federal dam at Troy.

Previous to July, 1913, the gage had been located at old lock in Waterford side-cut, at the wooden bridge across the Hudson at

Waterford, and on the coffer-dam below lock No. 2. On July 11, 1913, the gage was located on the north side of the timber crib approach wall to lock No. 2. On October 17, 1916, this was replaced by a standard Type A gage, No. 131, secured to the north side of the north lower concrete approach wall to lock No. 2 and having a range of 16 feet, in two sections. The lower section is between elevations 16.0 and 24.0 and the upper section between elevations 24.0 and 32.0. Standard bench-mark plugs are set, one near the lower section at elevation 23.0 (B. C. datum) and another near the upper section at elevation 28.0 (B. C. datum).

The gage is read twice daily — at 7 or 8 A. M. and 4 or 5 P. M. — to half-tenths.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER AT WATERFORD, for the year ended June 30, 1919. Chas. Wolff and John Kircher, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	17.45	16.65	17.10	18.10	19.75	18.15	18.10	18.25	18.05	20.25	18.65	18.30
2.	17.85	16.75	16.75	18.05	19.85	18.05	17.92	17.95	19.60	19.85	18.85	18.20
3.	17.40	16.50	16.75	18.00	19.25	17.95	17.85	17.75	19.15	19.60	19.30	18.00
4.	17.05	16.45	17.00	18.20	19.10	18.10	17.80	17.85	18.90	19.60	19.20	18.05
5.	17.00	16.52	16.85	18.10	18.90	17.95	a	17.80	18.85	19.80	19.60	17.95
6.	17.30	16.62	16.75	17.85	18.25	17.90	a	17.75	19.05	20.00	19.90	17.60
7.	17.10	16.50	17.00	17.85	18.50	17.90	18.50	17.75	18.90	20.30	19.50	17.60
8.	16.85	16.55	16.95	18.65	18.25	17.95	18.50	17.70	18.60	20.45	19.50	17.20
9.	17.00	16.58	16.70	18.55	18.15	18.10	18.50	17.30	19.25	20.45	19.50	17.40
10.	17.15	17.10	16.70	18.25	17.85	18.10	18.60	17.45	20.15	20.70	19.40	17.60
11.	17.45	16.90	16.65	18.15	17.90	18.15	18.10	17.60	19.85	20.90	19.90	17.70
12.	17.40	16.75	16.95	18.10	17.95	18.10	18.20	17.65	19.30	22.55	20.08	17.60
13.	17.15	17.00	16.85	17.90	17.90	18.15	18.30	17.45	19.00	23.32	20.30	17.50
14.	17.40	16.75	16.75	17.65	17.90	18.15	18.25	17.50	19.00	22.55	19.70	17.45
15.	17.85	16.95	16.85	17.75	17.75	18.15	18.25	17.60	18.65	21.50	19.35	17.30
16.	17.90	16.75	16.75	17.60	17.85	17.85	18.15	17.65	18.40	20.30	19.05	17.55
17.	17.72	16.75	17.20	17.40	17.75	17.82	18.00	17.75	18.60	19.90	19.00	17.70
18.	17.50	16.85	17.20	17.55	17.42	18.10	18.05	17.65	19.45	20.70	19.70	17.75
19.	17.45	16.48	17.10	17.50	19.15	17.92	18.05	17.65	20.00	20.35	19.85	17.50
20.	17.65	16.45	17.20	17.60	19.50	17.85	18.05	17.55	19.60	19.85	19.60	17.65
21.	17.10	16.80	17.45	18.42	18.95	17.92	18.00	17.40	19.85	19.55	19.25	17.35
22.	17.92	16.90	18.10	18.15	19.10	18.40	17.95	17.45	20.00	19.30	19.40	17.20
23.	17.25	16.78	16.95	18.00	18.85	18.55	17.95	17.30	19.90	19.10	20.05	17.15
24.	16.85	16.70	17.30	17.90	18.62	19.65	18.60	17.35	19.80	19.00	20.30	17.10
25.	17.82	16.75	17.35	17.90	18.50	20.35	18.80	17.50	19.65	19.10	20.30	17.10
26.	16.70	16.58	17.85	17.80	18.55	20.62	18.90	17.90	19.70	19.00	20.35	17.35
27.	16.75	16.65	18.55	18.25	18.15	19.92	18.50	17.80	19.50	19.05	19.75	17.05
28.	16.60	16.55	19.00	18.05	18.10	18.85	18.40	17.75	20.75	18.95	19.70	17.05
29.	16.65	16.50	18.45	17.92	18.00	18.80	18.30	.....	21.35	18.90	19.20	17.20
30.	16.90	16.60	18.25	20.10	18.15	18.15	18.28	.....	20.65	18.90	18.80	17.35
31.	16.85	16.70	.....	19.75	.....	18.20	18.20	.....	20.60	.....	18.65	.....

a No record.

NINE-MILE CREEK

DESCRIPTION

Nine-Mile creek drains a large portion of the territory on the north side of the Mohawk between Utica and Rome, emptying into the latter stream near Oriskany.

Water for the supply of the Rome summit level of the Barge canal will be diverted from West Canada creek above the Morgan dam at Trenton Falls through the Nine-Mile feeder to this stream, thence to the canal, which it enters three miles east of the main spillway for the Mohawk river and the east summit level guard-gate. Nine-Mile creek leaves the canal opposite its entrance over a concrete spillway with rounded crest 700 feet long at elevation 420.0, the canal pool. At the west end of the spillway there is a Taintor gate 24 feet long with sill at elevation 408.0.

NINE-MILE CREEK NEAR STITTVILLE

Gage No. 159

Location.—At a highway bridge over Nine-Mile creek, known as Powell's bridge, about $1\frac{3}{4}$ miles below the village of Stittville and about 3 miles from the village of Marcy.

Drainage area.—59 square miles.

Records available.—Water-surface elevations, November 4, 1905, to June 30, 1919; discharge, January 1, 1907, to June 30, 1917. A gaging station was maintained at this point by the United States Deep Waterways Commission during its survey in 1898.

Gage.—A standard chain gage attached to the downstream side of the bridge is read twice daily—A. M. and P. M.—to tenths.

Discharge computations.—New rating curve used, beginning October 1, 1915. Due to the failure of the bridge abutment on June 3, 1916, the channel is partly obstructed and a new rating curve will be necessary. Sufficient measurements to establish this curve have not yet been made.

Control.—Rock. The channel is of uniform section and straight for several hundred feet above and below bridge.

Extremes of discharge.—Extremes for current year are not available.

1907-1917: Maximum recorded discharge, October 8, 1907, at 7 A. M., elevation 489.4; estimated discharge, 6,000 second-feet. Minimum recorded discharge, August 1, 17, 18 and 19, 1916, elevation, 483.7; discharge, 4 second-feet.

Winter flow.—Discharge relation seriously affected by ice.

Daily elevation of water-surface (B. C. datum) of NINE-MILE CREEK NEAR STITT-VILLE, for the year ended June 30, 1919. Mrs. Geo. Powell, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	484.85	484.25	484.35	484.5	484.9	484.4	484.7	483.85	b	484.35	484.3	483.6
2.....	484.4	484.3	484.1	484.4	485.3	484.4	485.4	483.95	b	484.25	484.3	484.05
3.....	484.15	484.3	484.35	484.7	484.7	484.4	484.85	484.2	b	484.35	484.3	484.2
4.....	484.35	484.35	484.3	484.45	484.75	484.4	484.0	484.3	484.9	484.8	484.2	484.3
5.....	484.35	484.4	484.45	484.4	484.65	484.35	484.05	484.3	485.0	485.1	484.65	484.8
6.....	484.35	484.35	484.45	485.25	484.3	484.15	484.7	484.2	484.9	484.75	484.5	484.3
7.....	484.35	484.4	484.4	484.65	484.3	484.0	484.2	484.1	484.4	485.1	484.2	484.3
8.....	484.3	484.4	484.35	484.45	484.8	484.05	484.25	484.05	484.3	484.55	484.05	484.3
9.....	484.6	485.4	484.3	484.4	484.35	485.15	484.1	483.75	485.5	485.1	484.3	484.3
10.....	484.55	484.5	484.3	484.4	484.65	484.8	483.9	484.05	484.95	484.8	484.35	484.8
11.....	484.65	484.4	484.3	484.3	484.3	484.0	484.3	484.1	484.5	486.55	485.35	484.3
12.....	484.55	484.8	484.4	484.3	484.8	484.05	484.4	484.3	484.65	485.15	484.45	484.3
13.....	484.65	484.3	484.7	484.3	484.4	484.3	484.6	484.3	484.7	484.5	484.1	484.3
14.....	484.5	484.3	484.55	484.3	484.35	485.5	484.55	484.6	484.5	484.3	484.15	484.2
15.....	484.5	484.3	484.35	484.3	484.35	485.4	484.3	b	484.35	484.2	484.25	484.15
16.....	484.45	484.3	484.5	484.25	484.4	484.8	484.3	b	484.4	484.05	483.95	484.3
17.....	484.55	484.3	484.95	484.15	484.4	483.9	484.3	b	485.1	484.4	484.4	484.4
18.....	484.5	484.3	485.4	484.15	485.25	483.5	484.15	b	485.65	484.3	484.7	484.35
19.....	484.35	484.15	484.35	484.2	485.4	483.6	484.3	b	484.8	484.15	484.4	484.3
20.....	484.45	484.1	484.95	485.6	484.8	483.6	484.4	b	484.9	484.1	484.2	484.3
21.....	484.4	484.1	484.65	485.15	484.5	484.05	484.35	b	484.35	484.25	484.05	484.2
22.....	484.35	484.1	484.6	484.6	484.4	485.25	484.45	b	484.5	484.0	484.0	484.05
23.....	484.4	484.05	484.55	484.6	484.4	485.5	484.5	b	484.35	483.8	484.05	483.9
24.....	484.3	484.15	484.55	484.45	484.4	484.8	485.4	b	484.35	484.35	484.55	483.9
25.....	484.35	484.15	484.7	485.9	484.35	485.55	484.4	b	484.35	484.55	484.4	483.9
26.....	484.3	484.15	484.7	485.65	484.3	485.2	484.3	b	484.3	484.4	484.2	484.0
27.....	484.3	484.2	484.65	485.05	484.3	484.6	484.4	b	484.35	484.25	484.0	484.85
28.....	484.3	484.35	484.6	484.6	484.3	484.0	484.25	b	484.9	484.3	483.95	484.3
29.....	484.35	484.4	484.5	484.6	484.6	483.65	484.3	.....	484.6	484.3	483.95	484.2
30.....	484.35	484.4	484.5	485.7	484.5	484.4	484.3	.....	484.6	484.15	483.85	484.25
31.....	484.35	484.45	.....	484.85	.....	483.9	484.1	.....	484.55	.....	483.8	.....

b Chain missing.

WEST CANADA CREEK DESCRIPTION OF BASIN

West Canada creek rises in West Canada lake, in southwest-central Hamilton county, and flows southwestward, then southeastward into the Mohawk at Herkimer. The drainage area, approximately 584 square miles, is shown on the Utica, Little Falls, Remsen, Wilmurt, Old Forge and West Canada Lakes sheets, United States Geological Survey topographic maps.

There are about fifty small lakes and a few undrained ponds in the watershed of the stream. Most of these are situated near the headwaters, the largest single water-surface, exclusive of the Hinckley reservoir, being Honnedaga lake, 1.4 square miles in extent. There is also a small amount of controllable storage in reservoirs formed by three dams. Swamps and marshes are numerous in the region of the headwaters, usually adjoining lakes and tributaries and having an extent of one-half square mile or less each. At Trenton Falls there is an important plant of the Utica Gas & Electric Co.

Much of the region above the Hinckley reservoir is timber-covered. There are extensive sand areas in the central and upper drainage basins. The soil of the upper watershed is underlaid by granitic gneiss usually at or near the surface, excepting in alluvial valleys. From a point just above Twin Rock bridge (now submerged by the Hinckley reservoir) and extending downstream beyond Trenton Falls the underlying geological formation is Trenton limestone.

Compacted snow accumulates in the woodlands in winter, often to a depth of three or four feet, representing an inch of water for each five or six inches of snow. This melts slowly, feeding the stream in March and April, which months may show a run-off greatly exceeding the precipitation.

At Hinckley the State constructed and put in operation in January, 1915, a storage reservoir of 3,445,000,000 cubic feet capacity for the supply of the Rome summit level of the Barge canal. The stored water is passed down West Canada creek and a portion of it is diverted by a new dam on the site of the old Morgan dam at Trenton Falls, through a feeder canal and Nine-Mile creek to the Barge canal.

For table of drainage areas of West Canada creek, see page 296.

HINCKLEY RESERVOIR

Gage No. 163

This station is on West Canada creek at the dam of the Hinckley reservoir, a part of the water-supply system for the Barge canal. The dam, about 1,600 feet above the highway bridge at Hinckley, consists of earth dykes with concrete core and a concrete spillway with an ogee crest 400 feet long at elevation 1,225.0. At the north end of the spillway are four 60-inch discharge pipes with center of outlets at elevation 1,169.5. At the south end are two 42-inch pipes with center of inlets at elevation 1,164.25 for the use of the Consolidated Water Co., which diverts water at this point to Utica. The reservoir has a capacity of 3,445,000,000 cubic feet below, and a water-surface area of about 4.46 square miles at crest elevation. While small amounts of water were impounded during construction as early as April, 1914, the reservoir was first used for regulative purposes in January, 1915. A concrete staff gage on the south face of the north gate-house indicates reservoir surface just above spillway. It was read to tenths once daily—at 8 A. M.—from July 1 to April 20, and twice daily—at 8 A. M. and 4 P. M.—from April 20 to June 30.

Daily elevation of water-surface of HINCKLEY RESERVOIR AT HINCKLEY DAM, for the year ended June 30, 1919. W. H. Thomas, [Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,224.6	1,224.3	1,219.9	1,224.6	1,226.9	1,221.4	1,222.6	1,208.8	1,186.0	1,224.5	1,224.5	1,224.8
2.....	1,225.2	1,224.15	1,220.1	1,224.6	1,226.5	1,221.0	1,222.6	1,208.0	1,186.0	1,224.4	1,224.4	1,224.95
3.....	1,225.5	1,224.0	1,220.0	1,224.0	1,226.1	1,220.4	1,223.6	1,207.3	1,187.0	1,224.2	1,225.1	1,225.1
4.....	1,225.5	1,223.8	1,219.8	1,224.0	1,225.9	1,220.0	1,223.0	1,206.7	1,187.5	1,223.9	1,225.2	1,224.95
5.....	1,225.4	1,223.7	1,219.2	1,225.1	1,225.7	1,219.4	1,223.6	1,205.8	1,188.0	1,223.7	1,225.3	1,224.8
6.....	1,225.35	1,223.55	1,219.8	1,225.4	1,225.7	1,218.8	1,223.4	1,204.9	1,188.5	1,223.8	1,225.2	1,224.55
7.....	1,225.3	1,223.45	1,219.8	1,225.5	1,225.5	1,218.0	1,222.8	1,204.0	1,188.0	1,224.1	1,225.2	1,224.4
8.....	1,225.25	1,223.3	1,219.7	1,225.9	1,225.4	1,217.2	1,222.0	1,203.2	1,190.0	1,225.0	1,225.3	1,224.25
9.....	1,225.2	1,223.3	1,219.6	1,225.8	1,225.5	1,216.5	1,221.8	1,202.0	1,190.5	1,226.0	1,225.15	1,224.05
10.....	1,225.3	1,223.4	1,219.6	1,225.7	1,225.4	1,216.0	1,221.0	1,201.5	1,192.0	1,226.5	1,224.9	1,223.85
11.....	1,225.4	1,223.3	1,219.2	1,225.5	1,225.4	1,215.3	1,220.5	1,200.1	1,193.7	1,226.5	1,224.75	1,223.7
12.....	1,225.45	1,223.3	1,219.0	1,225.4	1,225.4	1,214.6	1,219.4	1,199.3	1,195.0	1,225.5	1,225.1	1,223.45
13.....	1,225.7	1,223.2	1,218.9	1,225.4	1,225.3	1,214.0	1,219.0	1,198.5	1,196.0	1,227.5	1,226.35	1,223.2
14.....	1,225.7	1,223.0	1,218.9	1,225.3	1,225.3	1,213.2	1,218.6	1,197.5	1,196.0	1,226.7	1,226.05	1,223.1
15.....	1,225.7	1,222.9	1,218.9	1,225.3	1,225.3	1,213.2	1,217.8	1,196.8	1,196.8	1,226.1	1,224.8	1,223.0
16.....	1,225.6	1,222.8	1,219.0	1,225.1	1,225.2	1,214.2	1,217.0	1,196.0	1,197.2	1,225.7	1,224.6	1,223.85
17.....	1,225.6	1,222.8	1,218.9	1,225.1	1,225.0	1,214.6	1,216.2	1,195.6	1,197.5	1,225.0	1,225.0	1,223.7
18.....	1,225.4	1,222.4	1,219.0	1,225.0	1,224.9	1,214.0	1,215.7	1,195.0	1,196.5	1,225.8	1,226.05	1,223.45
19.....	1,225.5	1,222.2	1,219.5	1,225.0	1,225.0	1,214.2	1,214.8	1,194.1	1,201.8	1,225.6	1,226.15	1,223.25
20.....	1,225.4	1,222.0	1,219.7	1,225.1	1,225.2	1,213.7	1,213.9	1,193.2	1,204.5	1,225.4	1,225.95	1,223.05
21.....	1,225.35	1,221.8	1,220.0	1,225.5	1,225.2	1,213.0	1,213.2	1,192.5	1,207.1	1,225.3	1,225.85	1,221.9
22.....	1,225.3	1,221.6	1,220.5	1,225.9	1,225.1	1,213.7	1,212.2	1,191.7	1,210.2	1,225.2	1,225.75	1,221.8
23.....	1,225.2	1,221.4	1,220.7	1,225.7	1,224.8	1,214.8	1,211.4	1,191.0	1,213.0	1,225.2	1,225.8	1,221.65
24.....	1,225.15	1,221.3	1,220.9	1,225.7	1,224.5	1,219.0	1,210.9	1,189.8	1,215.7	1,225.1	1,225.7	1,221.35
25.....	1,225.0	1,221.0	1,221.2	1,225.5	1,224.0	1,221.4	1,210.2	1,188.1	1,216.7	1,225.0	1,225.6	1,220.95
26.....	1,224.9	1,220.8	1,221.5	1,225.6	1,223.4	1,223.2	1,211.4	1,187.2	1,218.0	1,225.0	1,225.55	1,220.9
27.....	1,224.8	1,220.6	1,221.5	1,225.6	1,223.3	1,223.9	1,211.3	1,186.6	1,219.1	1,224.75	1,225.55	1,221.3
28.....	1,224.75	1,220.4	1,221.2	1,225.6	1,223.1	1,224.1	1,211.3	1,186.3	1,219.6	1,224.6	1,225.35	1,221.8
29.....	1,224.6	1,220.1	1,221.3	1,225.6	1,222.6	1,223.9	1,210.9	1,185.0	1,220.0	1,224.5	1,225.2	1,221.95
30.....	1,224.4	1,220.0	1,221.1	1,225.5	1,222.5	1,223.5	1,210.0	1,184.0	1,220.0	1,224.5	1,225.1	1,222.0
31.....	1,224.3	1,219.8	1,221.0	1,225.4	1,222.4	1,223.0	1,209.4	1,183.0	1,220.0	1,224.4	1,224.95	1,222.0

WEST CANADA CREEK AT HINCKLEY

Location.—About 1 mile below Hinckley dam and $\frac{1}{4}$ mile below bridge of N. Y. C. railroad, on west bank of creek.

Drainage area.—373 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—June 14, 1919, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder on the right bank, about 1 mile below Hinckley dam, installed June 14, 1919. Recorder inspected by W. H. Thomas, gate-tender at State dam.

Channel and control.—Large boulders on solid rock bottom; practically permanent.

Extremes of discharge.—Maximum stage from water-stage recorder, 4.15 feet at 11 A. M., June 29; discharge, 660 second-feet. Minimum stage from water-stage recorder, 2.95 feet at 5 P. M., June 29; discharge, 85 second-feet.

Ice.—Stage-discharge relation not affected by ice.

Regulation.—Seasonal flow regulated by storage in Hinckley reservoir. Diurnal flow affected slightly at low stages by operation of the Fibre Company mill at Hinckley.

Diversions.—Consolidated Water Company of Utica diverts water-supply for Utica from Hinckley reservoir.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 100 and 2,000 second-feet. Daily discharge ascertained by applying mean daily gage-height to rating table. Results good.

Coöperation.—Station installed by Utica Gas and Electric Company. Maintained by United States Geological Survey in coöperation with State Engineer and Surveyor and State Conservation Commission.

Discharge measurements of WEST CANADA CREEK AT HINCKLEY, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
June 4.....	J. W. Moulton.....	3.90	638
June 14.....	M. H. Carson.....	3.90	489
June 27.....	J. W. Moulton.....	3.81	417
June 29.....	J. W. Moulton.....	4.12	652
June 29.....	J. W. Moulton.....	3.48	278
June 29.....	J. W. Moulton.....	3.04	112

Daily gage height, in feet, of WEST CANADA CREEK AT HINCKLEY, for the year ended June 30, 1919

DAY	June	DAY	June	DAY	June
1.....		11.....		21.....	3.77
2.....		12.....		22.....	3.76
3.....		13.....		23.....	3.77
4.....		14.....	3.87	24.....	3.77
5.....		15.....	3.87	25.....	3.77
6.....		16.....	3.88	26.....	3.78
7.....		17.....	3.88	27.....	3.81
8.....		18.....	3.88	28.....	3.81
9.....		19.....	3.87	29.....	
10.....		20.....		30.....	3.81

Daily discharge, in second-feet, of WEST CANADA CREEK AT HINCKLEY, for the year ended June 30, 1919

DAY	June	DAY	June	DAY	June
1.....		11.....		21.....	418
2.....		12.....		22.....	413
3.....		13.....		23.....	418
4.....		14.....	473	24.....	418
5.....		15.....	473	25.....	418
6.....		16.....	479	26.....	424
7.....		17.....	479	27.....	440
8.....		18.....	479	28.....	440
9.....		19.....	473	29.....	386
10.....		20.....	404	30.....	440

NINE-MILE CREEK FEEDER CANAL NEAR HOLLAND PATENT

Location.— At mouth of Nine-Mile feeder about 4 miles east of Holland Patent, Oneida county, $\frac{1}{2}$ mile below highway bridge near farm of P. A. Wade, which is about 4 miles south and 1 mile west of village of Barneveld.

Records available.— June 5, 1919, to June 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on right bank. Recorder inspected by P. A. Wade.

Discharge Measurements.— Made from highway bridge half a mile upstream from gage.

Control.— Suppressed weir of concrete with a lip about 1.5 feet high and a spillway inclined about 1 to 2. Permanent.

Regulation.— Flow in the feeder is regulated by gates at the intake of the canal just below the power-plant at Trenton Falls.

Diversions.— None.

Ice.—Feeder canal not in operation during winter months.

Accuracy.—Daily discharge ascertained by applying mean daily gage heights to rating table, or for days of considerable fluctuation by discharge integration. Rating table well defined between 50 and 200 second-feet. Results good.

Coöperation.—United States Geological Survey in coöperation with State Engineer and Surveyor.

Discharge measurements of NINE-MILE CREEK FEEDER CANAL NEAR HOLLAND PATENT, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1919		<i>Feet</i>	<i>Sec.-ft.</i>
June 8.....	M. H. Carson.....	1.72	104
June 14.....	M. H. Carson.....	1.585	93.4
June 28.....	M. H. Carson.....	1.50	89.8

Daily gage height, in feet, of NINE-MILE CREEK FEEDER CANAL NEAR HOLLAND PATENT, for the year ended June 30, 1919

DAY	June	DAY	June	DAY	June
1.....		11.....	1.57	21.....	1.55
2.....		12.....	1.58	22.....	1.53
3.....		13.....	1.58	23.....	1.54
4.....		14.....	1.58	24.....	1.53
5.....		15.....	1.58	25.....	1.53
6.....	1.70	16.....	1.58	26.....	1.53
7.....	1.66	17.....	1.58	27.....	1.56
8.....	1.67	18.....	1.58	28.....	1.49
9.....	1.66	19.....	1.57	29.....	1.48
10.....	1.59	20.....	1.56	30.....	1.49

NOTE.—Record began June 6.

Daily discharge, in second-feet, of NINE-MILE CREEK FEEDER CANAL NEAR HOLLAND PATENT, for the year ended June 30, 1919

DAY	June	DAY	June	DAY	June
1.....		11.....	93	21.....	92
2.....		12.....	94	22.....	90
3.....		13.....	94	23.....	91
4.....		14.....	94	24.....	90
5.....		15.....	94	25.....	90
6.....	105	16.....	94	26.....	90
7.....	101	17.....	94	27.....	92
8.....	102	18.....	94	28.....	86
9.....	101	19.....	93	29.....	85
10.....	95	20.....	92	30.....	86

WEST CANADA CREEK AT POWER DAM, TRENTON FALLS

Gage No. 162

Location.—At the power dam and plant of the Utica Gas and Electric Company at Trenton Falls.

Drainage area.—376 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—November 1, 1905, to June 30, 1917.

Gage.—Vertical chain gage on upstream face of dam, read twice daily—at 8 A. M. and 5 P. M. Owing to irregular fluctuation, water-surface elevations are not published.

Discharge computations.—Discharge over the two spillways computed by weir formula, using coefficients derived from United States Geological Survey experiments and the assumption that the water-surface varies uniformly between the two daily readings as a basis for estimating duration and head of actual overflow. Flow through wheels estimated from average kilowatts developed per machine-hour during the twenty-four hours for which the total kilowatts developed. The number of machines operated and length of runs are furnished by the company. The relation is based on measurements made by the company over weirs in the tail-race.

Control.—Masonry crest of concrete dam 97.9 feet long at elevation 1,019.12* and by-pass cut through rock with crest 163.4 feet long, two feet below that of dam but provided with flash-boards to dam crest elevation for use during low-water periods, together with wheels in power-plant operating under a head of approximately 270 feet.

Extremes of discharge.—1905–1918: Maximum recorded discharge, March 28, 1913, 25,700 second-feet. Minimum recorded discharge, on several days, 0 second-feet, when the pond was low and the wheels shut down.

Diversion.—The Consolidated Water Company of Utica diverts water at Hinckley for the supply of the city of Utica.

Regulation.—By new Barge canal storage reservoir at Hinckley, capacity 3,445,000,000 cubic feet, about 4 miles upstream.

* Incorrectly printed as 1,009.12 in Report of State Engineer and Surveyor for 1915, Vol. II, page 319.

Small amounts of water were impounded during construction as early as April, 1914, but this reservoir was first used for regulative purposes in January, 1915. There are several small reservoirs farther up the stream.

Accuracy.—The kilowatts used in estimating the flow through the wheels is the total developed during 24 hours. The pondage is very limited and the surface fluctuates often as much as 10 feet during 24 hours in the low-water season. In connection with the calculated discharge at Trenton Falls it may be stated that there are a variety of conditions which tend to limit the accuracy obtainable.

Coöperation.—Maintained in coöperation with the United States Weather Bureau.

Daily elevation of water-surface (B. C. datum) of WEST CANADA CREEK AT POWER DAM, TRENTON FALLS, for the year ended June 30, 1919.
C. W. Young, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,018.02	1,019.15	a	1,020.31	1,021.69	1,020.31	1,020.31	1,020.23	1,019.81	1,019.94	1,019.90	1,019.85
2.....	1,018.56	1,019.10	a	1,020.31	1,020.10	1,020.31	1,020.36	1,020.40	1,019.98	1,019.94	1,019.90	1,019.90
3.....	1,018.64	1,019.10	1,019.40	1,020.31	1,020.73	1,020.23	1,020.31	1,020.23	1,019.81	1,020.06	1,019.90	1,019.56
4.....	1,018.56	1,019.27	1,019.40	1,020.31	1,020.36	1,020.36	1,020.31	1,020.19	1,019.81	1,020.06	1,020.31	1,016.02
5.....	1,018.14	1,018.94	1,019.31	1,020.31	1,020.23	1,020.23	1,020.31	1,020.15	1,019.85	1,020.06	1,020.06	1,019.19
6.....	1,017.94	1,017.52	1,019.27	1,019.77	1,020.10	1,020.23	1,020.31	1,020.15	1,019.56	1,020.48	1,020.02	1,015.73
7.....	1,018.06	1,017.52	1,019.27	1,020.36	1,019.94	1,020.40	1,020.31	1,020.15	1,019.65	1,020.10	1,020.02	1,015.94
8.....	1,017.44	1,017.15	1,019.48	1,020.36	1,019.86	1,020.40	1,020.31	1,020.15	1,019.52	1,020.15	1,019.94	1,019.56
9.....	1,017.86	1,018.81	1,019.31	1,020.19	1,019.69	1,020.31	1,020.31	1,020.23	1,019.65	1,021.06	1,019.90	1,014.69
10.....	1,018.10	1,017.86	1,019.19	1,019.98	1,019.90	1,020.31	1,020.31	1,020.06	1,016.80	1,021.36	1,019.90	1,012.40
11.....	1,018.44	1,010.48	1,019.27	1,019.77	1,019.81	1,020.23	1,020.23	1,019.98	1,017.60	1,021.48	1,020.31	1,016.19
12.....	1,018.70	1,019.19	1,019.31	1,019.60	1,019.77	1,020.23	1,020.31	1,019.98	1,017.77	1,023.73	1,019.98	1,016.56
13.....	1,019.02	1,019.02	1,019.40	1,019.73	1,019.73	1,020.19	1,020.27	1,019.98	1,016.36	1,021.73	1,019.94	1,018.98
14.....	1,019.31	1,018.81	1,019.31	1,019.56	1,019.65	1,020.19	1,020.27	1,019.98	1,016.80	1,021.52	1,019.90	1,018.98
15.....	1,018.77	1,018.77	a	1,019.56	1,019.56	1,020.31	1,020.27	1,019.98	1,016.80	1,020.86	1,019.90	1,019.48
16.....	1,018.52	1,018.69	1,019.40	1,019.52	1,019.56	1,020.19	1,020.27	1,020.02	1,019.69	1,020.60	1,018.98	1,017.31
17.....	1,018.31	1,018.48	1,019.40	1,019.52	1,019.90	1,020.06	1,020.27	1,019.98	1,014.94	1,020.60	1,019.90	1,017.81
18.....	1,018.44	1,019.40	1,019.31	1,019.48	1,019.90	1,019.98	1,020.27	1,019.94	1,014.98	1,020.56	1,020.19	1,016.19
19.....	1,018.40	1,019.02	1,019.40	1,019.48	1,020.19	1,020.02	1,020.40	1,019.90	1,014.44	1,020.44	1,020.77	1,018.19
20.....	1,018.15	1,018.77	1,019.48	1,019.56	1,020.31	1,020.10	1,020.27	1,019.90	1,015.98	1,020.31	1,020.48	1,017.65
21.....	1,018.31	1,018.44	1,019.48	1,019.94	1,020.31	1,020.06	1,020.27	1,019.90	1,017.65	1,020.06	1,020.02	1,016.73
22.....	1,017.52	1,018.48	1,019.48	1,020.36	1,020.31	1,020.23	1,020.23	1,019.90	1,019.36	1,020.02	1,020.15	1,016.44
23.....	1,017.65	1,018.48	1,019.31	1,020.27	1,020.31	1,020.27	1,020.27	1,019.98	1,019.65	1,020.02	1,020.02	1,013.77
24.....	1,016.56	1,017.90	1,019.36	1,020.06	1,020.31	1,020.36	1,020.27	1,019.98	1,019.56	1,019.94	1,020.06	1,013.36
25.....	1,016.56	1,019.40	1,019.40	1,019.90	1,020.31	1,020.40	1,020.27	1,019.90	1,017.77	1,019.90	1,020.23	1,012.77
26.....	1,016.02	1,019.06	1,019.44	1,019.90	1,020.31	1,020.40	1,020.31	1,019.81	1,014.48	1,019.86	1,019.81	1,012.73
27.....	1,017.36	1,017.69	1,019.48	1,020.56	1,020.27	1,020.40	1,020.31	1,020.31	1,019.06	1,020.31	1,019.77	1,015.69
28.....	1,018.69	1,017.27	1,019.48	1,019.94	1,020.31	1,020.40	1,020.23	1,019.77	1,019.73	1,019.86	1,019.60	1,016.77
29.....	1,019.19	1,017.27	1,019.56	1,020.19	1,020.31	1,020.40	1,020.23	.....	1,019.90	1,019.86	1,019.52	1,019.23
30.....	1,019.19	1,017.19	1,019.40	1,020.23	1,020.31	1,020.36	1,020.23	.....	1,019.77	1,019.86	1,020.23	1,011.77
31.....	1,019.19	1,016.36	.....	1,021.36	.....	1,020.36	1,020.23	.....	1,019.73	.....	1,018.48	.....

a No water in creek above dam.

WEST CANADA CREEK AT MORGAN DAM, TRENTON FALLS

Gage No. 161

This station was established February 8, 1904, by this Department and is maintained in coöperation with the United States Weather Bureau. A staff gage is located on the right bank of the stream about 100 feet above the site of the old Morgan dam. A new dam has been constructed by the State 60 feet above the old dam to divert water through the Nine-Mile creek feeder for the supply of the Rome summit level of the Barge canal. The crest, at elevation 753.25, has an ogee type section and a length of about 147 feet. There is a Taintor gate with a clear span of 30 feet, sill at elevation 744.0 and top when closed at elevation 756.5. The gage is read twice daily—at 7 A. M. and 6 or 7 P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of WEST CANADA CREEK ABOVE MORGAN DAM, TRENTON FALLS, for the year ended June 30, 1919. C. W. Young, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	753.96	753.56	a	753.86	756.01	754.86	755.16	754.86	754.56	754.36	755.06	754.36
2.....	753.96	753.56	a	753.86	755.86	754.76	755.16	754.86	754.56	754.36	755.06	754.46
3.....	753.96	753.56	753.56	753.86	755.51	754.76	755.16	754.86	754.56	754.36	755.06	754.31
4.....	753.86	753.46	753.46	753.86	755.31	754.66	755.16	754.86	754.56	754.36	754.96	754.26
5.....	753.86	753.46	753.46	753.86	755.11	754.56	755.06	754.86	754.56	754.36	754.96	754.31
6.....	753.86	753.46	753.46	754.06	754.66	754.56	755.06	754.86	754.56	754.76	754.96	754.41
7.....	753.96	753.46	753.46	754.41	754.46	754.56	755.06	754.86	754.56	754.86	754.96	754.26
8.....	753.96	753.46	753.61	754.76	754.31	754.56	755.06	754.86	754.56	754.91	754.91	754.06
9.....	753.96	753.56	753.71	754.86	754.16	754.76	755.06	754.86	754.41	755.21	754.86	754.26
10.....	753.96	753.46	753.81	754.76	754.16	754.96	755.06	754.86	754.51	756.01	754.86	754.26
11.....	754.01	753.86	753.86	754.76	754.26	754.96	755.06	754.86	754.46	756.56	754.86	754.21
12.....	754.06	753.46	753.86	754.66	754.26	754.96	755.06	754.86	754.36	758.76	754.86	754.11
13.....	754.06	753.46	753.86	754.66	754.16	754.96	755.06	754.86	754.36	757.51	754.86	754.21
14.....	754.06	753.46	753.86	754.36	754.16	754.96	754.96	754.81	754.36	756.16	754.86	754.21
15.....	754.06	753.46	a	754.16	754.06	754.96	754.96	754.76	754.36	755.71	754.91	754.06
16.....	754.06	753.46	753.96	754.16	754.06	754.96	754.96	754.76	754.36	755.56	754.96	754.16
17.....	754.06	753.46	753.96	754.16	754.06	754.96	754.96	754.76	754.36	755.41	754.76	754.16
18.....	754.06	753.46	753.96	754.16	754.26	754.96	754.96	754.76	754.36	755.26	755.96	754.11
19.....	754.06	753.46	753.96	754.06	754.26	754.96	755.01	754.76	754.26	755.06	755.81	754.16
20.....	754.06	753.46	753.96	754.06	755.06	754.96	754.96	754.76	754.46	755.06	755.61	754.26
21.....	753.81	753.46	753.96	754.21	755.06	754.96	754.96	754.76	754.26	755.06	755.81	754.16
22.....	753.81	753.46	753.66	755.01	755.01	754.96	754.96	754.76	754.26	754.96	756.11	754.11
23.....	753.66	753.46	753.86	754.86	755.06	754.96	754.96	754.66	754.31	754.96	755.41	754.06
24.....	753.66	753.46	753.86	754.66	755.06	755.06	754.96	754.66	754.26	755.06	755.16	754.21
25.....	753.66	753.46	753.86	754.66	755.06	755.11	755.06	754.66	754.26	755.06	754.96	754.11
26.....	753.46	753.46	753.86	754.56	755.01	755.16	754.96	754.66	754.26	755.01	755.01	754.11
27.....	753.61	753.46	753.86	754.86	754.96	755.16	754.96	754.66	754.26	754.96	754.96	754.26
28.....	753.46	753.46	753.86	755.06	754.86	755.16	754.96	754.66	754.26	754.96	754.76	a
29.....	753.46	753.46	753.86	755.01	754.86	755.16	754.96	.....	754.26	755.06	754.66	a
30.....	753.56	753.46	753.86	754.76	754.86	755.16	754.86	.....	754.36	755.06	754.46	a
31.....	753.56	753.46	.....	755.36	.....	755.16	754.86	.....	754.36	.....	754.36	.....

a No record.

WEST CANADA CREEK AT KAST BRIDGE

Gage No. 160

Location.—At the highway bridge over West Canada creek known as Kast bridge, opposite the station of that name on the Herkimer and Remsen branch of the N. Y. C. R. R., about $3\frac{1}{2}$ miles above the village of Herkimer.

Drainage area.—575 square miles.

Records available.—Water-surface elevations, May 15, 1904, to June 30, 1918; discharge, January 1, 1907, to June 30, 1918.

Gage.—The gage is of the weight-and-reel type and is secured to the upstream side of the bridge. It is read twice daily—at 8 A. M. and 4 P. M.—to hundredths.

Control.—Gravel and cobble rift about 1,500 feet below the gage. The bed of the stream is permanent with a fairly straight and uniform channel from the control to quite a distance above the gage.

Extremes of discharge.—1907–1918: Maximum recorded discharge, March 26, 1913, at 8 A. M., elevation 451.06; estimated discharge, 23,300 second-feet. (See foot-note.) Minimum recorded discharge, September 12, 1913, at 8 A. M., elevation 441.64; discharge, 80 second-feet.

Winter flow.—Discharge relation affected by ice conditions. Discharge during January to March, inclusive, omitted.

Diversion.—The Consolidated Water Company of Utica diverts water at Hinckley for the supply of the city of Utica.

Regulation.—Seasonal by Barge canal storage reservoir at Hinckley, and daily by power-plant pondage at Trenton Falls.

NOTE.—A maximum elevation of 453.09 was recorded on February 11, 1917, at 4 P. M., due to backwater caused by stream filling with anchor ice and snow, but it is not believed that the discharge was a maximum.

GAGING OF STREAMS: MOHAWK RIVER BASIN

845

Daily elevation of water-surface (B. C. datum) of WEST CANADA CREEK AT EAST BRIDGE, NEAR HERRIMAN, for the year ended June 30, 1919. Lloyd Kast, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	443.40	442.38	442.78	442.96	445.59	443.90	444.12	443.89	444.78	444.03	444.01	443.07
2.....	443.12	442.46	442.00	442.88	445.49	443.94	445.21	443.80	443.90	443.93	444.59	443.01
3.....	443.31	442.44	441.86	443.36	444.76	444.06	444.82	443.78	443.75	443.87	444.13	443.09
4.....	442.97	442.34	442.56	443.00	444.36	443.98	444.18	443.71	443.84	444.18	443.91	442.89
5.....	442.80	442.60	442.60	442.88	444.08	443.96	444.04	443.67	b	444.56	444.50	442.99
6.....	442.68	442.51	443.00	443.98	443.74	444.01	444.05	443.72	b	444.41	444.16	444.03
7.....	442.52	442.48	442.70	443.97	443.62	444.00	444.15	443.68	b	444.39	444.17	442.80
8.....	442.53	442.50	442.65	444.05	443.48	443.94	444.16	443.69	b	444.17	444.27	442.79
9.....	442.66	442.95	442.50	443.97	443.36	444.74	444.13	443.61	b	445.08	444.13	442.79
10.....	443.08	442.48	442.58	443.64	443.46	444.05	444.07	443.60	b	446.69	444.10	442.66
11.....	442.99	442.60	a	443.32	443.38	444.00	444.00	443.49	b	445.99	444.68	442.74
12.....	443.04	442.36	442.62	443.20	443.32	443.94	443.88	443.66	443.64	448.06	444.33	442.63
13.....	443.24	442.44	443.06	443.04	443.30	443.94	443.94	443.58	443.60	447.15	444.44	442.61
14.....	443.72	442.50	443.05	443.10	443.26	444.46	444.08	443.57	443.41	446.10	444.09	442.57
15.....	443.44	442.49	442.86	443.02	443.12	445.20	443.98	443.74	443.12	445.28	443.93	442.71
16.....	443.16	442.46	442.40	442.95	443.05	444.21	444.01	443.62	448.15	444.80	443.89	442.71
17.....	443.04	442.38	443.15	442.96	443.41	444.06	443.92	443.40	443.94	444.91	444.03	442.69
18.....	443.16	442.32	443.12	442.77	444.18	444.02	443.90	443.42	445.06	444.79	444.63	442.63
19.....	443.02	442.42	443.32	442.74	444.73	443.94	443.92	443.42	443.86	444.51	445.02	442.61
20.....	442.76	442.42	443.23	442.98	444.24	443.92	443.95	443.43	443.96	444.37	444.65	442.71
21.....	442.56	442.40	443.30	444.27	444.23	443.86	443.88	443.41	444.09	444.35	444.47	442.43
22.....	442.42	442.46	442.88	444.06	444.05	444.52	443.88	443.45	443.74	444.19	444.25	442.49
23.....	442.66	442.45	442.82	443.90	444.04	445.10	443.94	443.86	443.38	444.19	444.36	442.53
24.....	442.48	442.42	443.24	443.68	443.96	444.45	444.64	443.44	443.36	444.09	444.35	442.51
25.....	442.44	442.42	443.10	443.46	443.96	445.60	444.16	443.30	443.24	443.95	444.16	442.36
26.....	442.39	442.36	443.89	444.46	444.00	444.61	443.92	443.35	443.26	444.93	444.14	442.43
27.....	442.40	442.38	443.43	444.31	443.78	444.32	443.92	443.28	443.28	444.07	444.16	443.01
28.....	442.35	442.50	443.22	444.22	443.85	444.07	443.83	443.26	c	444.05	443.75	442.73
29.....	442.40	442.48	442.98	444.11	444.28	444.18	443.84	.....	c	444.01	443.55	442.57
30.....	442.56	442.48	443.00	444.77	444.04	444.08	443.85	.....	443.76	443.97	443.32	442.45
31.....	442.48	442.52	.....	445.86	.....	444.06	443.78	.....	444.04	.....	443.23	.....

a No record.

b Tape broken.

c No record; high winds.

EAST CANADA CREEK

DESCRIPTION

East Canada creek rises in Hamilton county and flows southward between Herkimer and Fulton counties, joining the Mohawk at East Creek. In a general way its drainage basin is similar to that of West Canada creek, although its flow is less sustained and regular.

Spruce creek, the principal tributary of East Canada creek, enters 1 mile above Dolgeville and drains an area of 50 square miles. Water is diverted from this creek and from Beaver creek, one of the tributaries at Diamond Hill, and is carried to Little Falls through a cast-iron conduit 9 miles long.

For table of drainage areas of East Canada creek, see page 298.

EAST CANADA CREEK AT DOLGEVILLE

A gaging station on this stream was established for the U. S. Board of Engineers on Deep Waterways in 1898. It was maintained by the U. S. Geological Survey in coöperation with this Department from 1900 to June, 1907, inclusive, when it was taken over by this Department.

Location.—At the power-plant of the Herkimer County Light and Power Company at High falls about 1 mile below the village of Dolgeville and about 7 miles above the mouth of the stream.

Drainage area.—257 square miles.

Records available.—September 23, 1898, to June 30, 1919.

Gage.—Above dam, a reference point on the right abutment; lower gage, a staff secured to the side wall of the tail-race below the power-plant. Readings twice daily—at 7 A. M. and 6 P. M.

Discharge computations.—Discharge over dam computed from curve based on United States Geological Survey experiments at Cornell University, with a full-sized model of the crest. Estimated flow through the turbines based on ratings by current-meter measurements made in the tail-race of the power-plant.

Control.—A masonry dam about 19 feet high with fixed flat crest 6 feet wide sloping downward upstream about 1 foot in 6, 190.25 feet long, upon which flash-boards are maintained during ordinary stages of the stream, together with turbines in power-plant.

Extremes of discharge.—1898–1918: Maximum discharge recorded, March 26, 1913, at 9 p. m., approximately 14,500 second-feet. Minimum discharge recorded, August 21, 1910, 0 second-feet. No water was used for 19 hours while the pond was filling.

Winter flow.—Very slightly affected by ice, as the crest is kept clean during the winter months.

Diversion.—From Spruce and Beaver creeks at Diamond Hill for water-supply of Little Falls; from Cold brook for water-supply of Dolgeville. The run-off given in the table of monthly discharge is that passing the station and is exclusive of the above diversions.

Regulation.—By storage on Canada lake and several smaller lakes tributary to Canada lake. The flow from the smaller lakes is used to maintain a nearly constant elevation of Canada lake which in turn is used to regulate the flow in East Canada creek.

Tables of discharge not yet available for publication.

SCHOHARIE CREEK

DESCRIPTION OF BASIN

The source of Schoharie creek is about two miles east of Tannersville, at an elevation of 1,940 feet. The source is within about four miles of the easterly escarpment of the Catskill plateau. The stream valley is broad and the slope moderate throughout the upper regions. A small area, which apparently was formerly tributary to Schoharie creek, has been cut off by erosion and has thus become tributary to Kaaterskill. Nearly the entire drainage basin is irregular and precipitous. It is extensively covered with second-growth forests.

The basin of Schoharie creek is largely overlaid by slaty rocks, into which water percolates only to a slight depth. The valley soil is largely thin plastic clay, formed by disintegration of the native rocks. Passing from the headwaters toward the mouth, Schoharie creek crosses successively the Devonian sedimentary rocks, chiefly of the Catskill, Oneonta, Ithaca and Hamilton formations. All of these may be considered fairly impervious and free from fissures. It then crosses belts of Silurian formations, including Helderberg, Salina, Niagara and Medina sandstone and limestone. These rocks are underlaid by impervious Hudson river shales, but are themselves permeable, yielding numerous springs at the lower partings.

It is the intention of the Board of Water Supply of the city of New York to build a dam on the Schoharie creek at Gilboa for an additional water-supply. A tunnel about 18 miles long, beginning at a point on the creek near the county line north of Prattsville, will carry the water to the Esopus creek in the vicinity of Allaben, whence it will follow the natural course of the Esopus creek until it empties into the Ashokan reservoir. The area diverted will be approximately 314 square miles.

The entire drainage basin of 930* square miles is shown on the topographic maps of the United States Geological Survey. For area at different points along the stream, see table on page 299.

* The 930 square miles used above is the result of a joint determination of drainage areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer, and replaces the figure 900 previously used in the reports of the State Engineer.

SCHOHARIE CREEK AT PRATTSVILLE

Location.—On upstream side of highway bridge at Prattsville. Automatic gage is located on downstream side, left bank. Pipe gage on right bank below bridge has been discontinued.

Drainage area.—236 square miles, planimetered on U. S. G. S. topographic maps. 1907–1912, inclusive, area considered 240 square miles, based on published records.

Records available.—January 1, 1903, to June 30, 1919.

Gage.—Standard Board of Water Supply chain gage, and Friez automatic water-stage recorder. Gage is read twice daily.

Discharge measurements.—From highway bridge; at low stages by wading 600 feet downstream from bridge.

Control.—Gravel bed, some small boulders. Affected by extreme freshets. Clear span, 187.5 feet. During low stages, dead water from Sta. 60 upward. Channel above bridge straight for about 300 feet. Channel below bridge straight for about 600 feet, with tendency to bifurcate at this point, where wading measurements are made. Both banks high, clean, and not liable to overflow except in extreme freshets.

Extremes of discharge.—Current year: Maximum stage recorded, 9.61 feet on March 28 at 4 A. M.; discharge, 6,850 second-feet. Minimum stage recorded, 4.47 feet on August 27 and 28; discharge, 13 second-feet.

1907–1919: Maximum stage recorded, 13.10 feet on March 27, 1913, at 4:45 P. M.; discharge, 16,500 second-feet. Minimum stage recorded, 4.13 feet on August 3, 1913; discharge, 5 second-feet.

Winter flow.—Discharge relation seriously affected by ice conditions. Flow determined by meter measurements and climatological data.

Accuracy.—Discharge rating curve fairly well defined. Beginning October 1, 1915, discharge is computed from record of automatic water-stage recorder.

Coöperation.—Maintained by Board of Water Supply of the city of New York.

Climatological observations are made at this station.

Daily discharge, in second-feet, of SCHOHARIE CREEK AT PRATTSVILLE, for the year ended June 30, 1919. J. A. Morris, H. M. Wood and I. Harrison, Observers

DAT	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	86	30	215	m 211	275	†149	403	†223	m1,762	698	299	248
2.....	95	23	110	172	215	†124	864	†207	698	583	392	223
3.....	76	20	65	169	189	†105	660	†203	438	597	343	196
4.....	90	18	41	162	175	†112	530	im 200	365	909	299	175
5.....	m 81	18	43	142	172	†98	409	†193	426	1,210	403	158
6.....	78	m 18	43	438	165	†74	†375	†189	511	1,520	370	136
7.....	81	18	43	449	152	im 59	†348	†186	354	1,710	333	142
8.....	74	m 18	35	318	145	†88	†328	†182	338	1,896	333	134
9.....	67	18	31	257	133	†78	†313	†179	1,010	1,632	333	122
10.....	59	20	33	211	136	†74	†299	†172	1,980	1,372	1,060	119
11.....	55	24	33	182	124	†65	†289	†169	855	1,394	2,008	112
12.....	55	21	31	182	124	†86	†280	†165	632	3,252	1,854	105
13.....	72	21	30	196	122	†122	†275	†162	557	1,736	2,165	105
14.....	86	m 21	39	189	119	231	†270	182	426	1,251	1,416	100
15.....	86	m 21	39	179	112	714	†266	235	359	936	m 1060	215
16.....	88	m 21	39	162	110	557	†261	219	365	990	873	443
17.....	86	18	43	155	114	426	†257	im 142	m 570	2,064	1,240	248
18.....	102	18	35	145	145	343	†252	†133	1,060	1,262	1,645	169
19.....	78	18	53	127	467	304	†244	127	819	936	m 1000	127
20.....	65	m 18	78	117	359	294	†240	127	698	746	770	175
21.....	61	18	203	139	280	240	im 235	114	668	646	706	142
22.....	m 63	16	219	139	235	252	†235	114	611	543	1,200	105
23.....	m 47	15	142	180	227	855	†474	119	530	467	1,619	98
24.....	45	15	119	122	211	683	1,060	136	474	486	1,240	105
25.....	47	15	100	117	193	1,606	505	165	409	505	1,000	m 95
26.....	37	13	576	110	†186	963	461	299	375	426	794	90
27.....	35	m 13	1,339	117	†165	675	370	235	397	392	632	252
28.....	31	13	524	107	†155	557	338	186	3,073	359	517	420
29.....	m 28	15	323	m 105	175	†486	299	.....	1,170	365	426	219
30.....	26	15	235	105	175	420	270	.....	1,070	328	359	m 165
31.....	37	m 15	.....	252	.....	381	244	.....	855	.....	294	.....
Mean...	65	18	162	181	185	362	376	177	770	1,040	870	171

m Meter measurement.

† Ice conditions.

NOTE.—Flow based on meter measurements and climatological data.

Monthly discharge, in second-feet, of SCHOHARIE CREEK AT PRATTSVILLE, for the year ended June 30, 1919

[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	
July.....	102	26	65	0.28	0.323
August.....	30	13	18	0.08	0.092
September.....	1,339	30	162	0.69	0.770
October.....	449	105	181	0.77	0.888
November.....	467	110	185	0.78	0.870
December.....	1,606	59	362	1.53	1.764
January.....	1,060	235	376	1.59	1.833
February.....	299	114	177	0.75	0.781
March.....	3,073	338	770	3.26	3.758
April.....	3,252	328	1,040	4.41	4.920
May.....	2,165	294	870	3.69	4.254
June.....	420	90	171	0.72	0.803
The year.....	3,252	13	365	1.55	21.056

SCHOHARIE CREEK AT MIDDLEBURG

Gage No. 158

Location.—At highway bridge over Schoharie creek at Middleburg.

Drainage area.—532 square miles. (From U. S. Geological Survey topographic maps.)

Records available.—August 24, 1906, to June 30, 1919.

Gage.—The old staff gage of two sections, the lower section attached to the end of a timber crib about 400 feet below the bridge and the upper secured to rubble retaining wall about 160 feet below the bridge, was replaced on February 5, 1919, by a standard staff gage established on a retaining wall on the east shore and about 30 feet above the highway bridge. The limits are from zero to 12 feet. The gage bench-mark, located on the northeast corner of the east abutment of the bridge, is at elevation 18.64 feet above the zero of the gage. Read twice daily—at 9 A. M. and 5 P. M.—to half-tenths.

Discharge measurements.—From bridge and by wading.

Control.—Riffle about 1,600 feet below bridge. The bed of the stream is of gravel and cobblestones and fairly smooth and permanent. The stream overflows the banks during floods.

Extremes of discharge.—1906–1917: Maximum recorded discharge, February 20, 1909, at 9 A. M., approximately 31,600 second-feet. Minimum discharge recorded, September 14 to 21, inclusive, 1913, 12 second-feet.

Winter flow.—Very slight effect from ice, open-water rating curve used.

Accuracy.—New rating curve used, beginning October 1, 1915; well defined to a gage height of 6 feet.

Daily gage height, in feet, of SCHOMBERG CREEK AT MIDDLEBURG, for the year ended June 30, 1919. George L. Danforth and Carlton Cornwell, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1.20	0.75	1.06	1.80	2.05	1.45	a	a	5.00	3.20	2.50	2.05
2.....	1.20	0.75	1.62	1.70	1.80	1.50	a	a	3.45	2.90	2.60	1.95
3.....	1.20	0.70	1.22	1.60	1.60	1.50	a	a	2.90	2.90	2.55	1.85
4.....	1.20	0.65	1.02	1.60	1.60	1.55	a	a	2.75	3.70	2.50	1.75
5.....	1.25	0.70	0.92	1.50	1.55	1.50	a	2.00	3.15	4.10	3.20	1.70
6.....	1.20	0.75	0.85	2.20	1.50	1.45	a	1.80	3.20	4.20	3.10	1.65
7.....	1.15	0.75	0.85	2.50	1.50	1.52	a	1.80	2.65	4.90	3.00	1.60
8.....	1.10	0.70	0.85	2.00	1.50	1.58	a	1.70	2.60	4.95	2.80	1.60
9.....	1.05	0.65	0.85	1.92	1.45	1.75	a	1.60	3.10	4.75	2.80	1.50
10.....	1.08	0.62	0.78	1.72	1.45	1.62	a	1.70	4.95	4.35	3.90	1.60
11.....	1.10	0.70	0.70	1.68	1.40	1.52	a	1.80	2.85	4.50	5.20	1.45
12.....	1.05	0.75	0.70	1.65	1.38	1.50	a	1.65	3.50	6.30	4.95	1.40
13.....	1.05	0.75	0.70	1.75	1.35	1.58	a	1.60	3.05	4.85	5.35	1.30
14.....	1.12	0.75	0.70	1.72	1.35	1.85	a	1.65	2.85	4.30	4.55	1.25
15.....	1.35	0.75	0.70	1.68	1.35	2.58	a	2.30	2.65	4.00	4.30	2.85
16.....	1.30	0.70	0.72	1.58	1.30	2.58	a	2.05	2.65	3.85	3.85	3.05
17.....	1.85	0.70	0.80	1.60	1.30	2.38	a	1.85	3.50	4.85	3.70	2.40
18.....	1.38	0.65	0.75	1.48	1.45	2.08	a	1.75	3.95	4.10	3.70	2.10
19.....	1.22	0.60	0.75	1.40	2.10	2.00	a	2.00	3.80	3.75	3.65	1.75
20.....	1.15	0.60	0.82	1.45	2.10	1.92	a	1.95	3.65	3.55	3.55	2.00
21.....	1.08	0.58	1.32	1.50	1.92	1.85	a	1.75	3.60	3.35	3.25	2.15
22.....	1.00	0.58	1.78	1.45	1.78	1.95	a	1.60	3.35	3.15	2.90	1.75
23.....	0.95	0.53	1.45	1.45	1.70	2.45	a	1.50	3.10	2.95	3.35	1.55
24.....	0.90	0.48	1.30	1.40	1.65	2.90	a	1.55	2.95	2.80	3.90	1.50
25.....	0.90	0.78	1.25	1.35	1.60	4.25	a	1.50	2.85	3.00	3.50	1.40
26.....	0.90	0.80	1.72	1.40	1.48	3.35	a	1.90	2.75	2.90	3.20	1.40
27.....	0.82	0.72	4.02	1.35	1.32	2.90	a	2.10	2.65	2.80	2.95	1.50
28.....	0.75	0.70	2.68	1.30	1.40	2.48	a	2.00	4.55	2.80	2.85	2.65
29.....	0.70	0.65	2.15	1.30	1.45	2.40	a	.....	4.60	2.75	2.60	2.05
30.....	0.70	0.65	1.85	1.40	1.40	2.40	a	.....	3.75	2.60	2.40	1.60
31.....	0.70	0.65	.....	1.70	.....	2.40	a	.....	3.40	.....	2.30	.....

a No record.

GAGING OF STREAMS: MOHAWK RIVER BASIN 353

SCHOHARIE CREEK AT CENTRAL BRIDGE

Gage No. 157

This station, established April 3, 1904, and maintained by this Department in coöperation with the United States Weather Bureau, is located on the D. & H. R. R. bridge across Schoharie creek near Schoharie Junction. Discharge is not computed at this station. The water-surface elevations are referred to United States Geological Survey datum. A standard chain gage attached to the downstream truss is read twice daily—A. M. and P. M.—to half-tenths.

Daily elevation of water-surface (U. S. G. S. datum) of SCHOHARIE CREEK AT CENTRAL BRIDGE, for the year ended June 30, 1919. A. M. Spencer, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	567.18	566.72	566.68	567.95	567.90	567.52	568.00	568.50	571.05	569.12	568.50
2	567.18	566.72	567.42	567.78	568.00	567.50	570.60	568.50	570.00	569.82	568.50
3	567.18	566.72	567.32	567.70	567.90	567.50	570.15	568.48	569.15	570.30	568.50
4	567.15	566.72	567.28	567.78	567.82	567.50	569.28	568.38	568.78	571.80	568.50
5	567.12	566.75	567.18	567.72	567.78	567.50	568.92	568.25	568.70	570.25	569.30
6	567.15	566.78	567.10	568.22	567.75	567.52	569.75	568.05	568.70	570.95	568.85
7	567.12	566.80	567.02	568.70	567.72	567.70	570.50	567.85	568.95	571.35	568.32
8	567.12	566.80	566.92	568.10	567.68	567.80	570.48	567.80	568.85	571.35	567.90
9	567.15	566.80	566.85	567.92	567.62	567.90	570.25	567.80	569.38	571.22	567.85
10	567.45	566.65	566.82	567.88	567.58	567.95	570.25	567.75	571.35	571.10	569.75
11	567.52	566.62	566.82	567.80	567.45	568.00	570.25	567.72	569.78	570.72	570.75
12	567.42	566.62	566.82	567.72	567.32	567.85	570.25	567.70	569.10	572.28	572.12
13	567.42	566.62	566.80	567.72	567.22	567.65	570.60	567.65	568.82	571.70	572.80
14	567.42	566.60	566.80	567.72	567.30	567.70	570.65	567.65	568.68	571.15	571.90
15	567.40	566.68	566.78	567.70	567.30	568.90	570.60	568.45	568.58	570.70	571.20
16	567.38	566.62	566.78	567.65	567.30	568.90	570.30	568.28	568.50	570.15	570.50
17	567.32	566.62	566.75	567.65	567.30	568.62	570.10	567.95	569.10	571.10	569.95
18	567.30	566.65	566.72	567.60	567.35	568.28	570.35	567.78	570.50	570.55	571.60
19	567.25	566.62	566.80	567.55	568.10	568.12	569.75	567.70	569.80	570.00	569.88
20	567.20	566.62	566.80	567.55	568.25	568.10	569.55	567.70	568.88	569.00	569.70
21	567.18	566.58	566.95	567.52	568.00	568.05	569.50	567.70	569.00	568.82	569.22
22	567.15	566.58	567.48	567.50	567.88	568.08	569.55	567.62	569.02	568.28	569.42
23	567.10	566.58	567.72	567.48	567.82	568.70	569.60	567.60	569.05	567.75	570.20
24	567.10	566.58	567.58	567.45	567.72	568.70	570.45	567.60	569.05	568.20	569.88
25	567.08	566.75	567.52	567.40	567.62	571.25	570.25	567.60	568.98	568.70	a
26	566.98	566.85	567.65	567.40	567.52	570.08	569.70	568.30	569.35	568.68	a
27	566.85	566.82	569.95	567.48	567.50	569.60	569.15	568.75	568.72	568.62	a
28	566.80	566.80	569.05	567.42	567.50	569.20	568.70	568.25	570.15	568.60	a
29	566.80	566.72	568.40	567.38	567.48	568.70	568.65	.....	569.92	568.60	a
30	566.75	566.65	568.05	567.35	567.50	568.25	568.60	.....	571.50	568.55	a
31	566.80	566.60	.....	567.50	.....	568.15	568.50	.....	570.25	.....	a

a No record.

NOTE.—Station discontinued May 31, 1919.

SCHOHARIE CREEK AT FORT HUNTER

Gage No. 156

This station, located on Schoharie creek above the State feeder dam at Fort Hunter, was originally established by the U. S. Deep Waterways Survey, September 24, 1898. Reestablished November 17, 1904, in coöperation with the U. S. Weather Bureau, it is now maintained by this Department. Because of unfavorable conditions, increased leakage and indeterminate diversion for the supply of the Erie canal, discharge estimates were discontinued December 31, 1914. A chain gage on the downstream side near the south end of the highway bridge about 500 feet above the dam is read twice daily—A. M. and P. M.—to tenths.

Daily elevation of water-surface (B. C. datum) of SCHOHARIE CREEK AT FORT HUNTER, for the year ended June 30, 1919. C. E. Wing, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	280.6	279.5	279.35	281.5	281.45	281.25	282.25	282.1	282.4	282.2	281.75
2	280.5	279.45	279.45	281.5	281.6	281.05	282.75	282.0	282.8	282.1	281.85
3	280.35	279.4	279.45	281.85	281.5	281.0	282.45	282.1	282.8	282.15	281.85
4	280.3	279.25	279.5	281.5	281.5	280.9	282.25	282.25	282.05	282.3	281.7
5	280.35	279.15	279.65	281.4	281.4	280.9	282.05	282.2	282.2	282.6	281.65
6	280.3	279.1	279.7	281.4	281.3	280.8	281.9	282.05	282.1	282.95	281.6
7	280.3	279.1	279.6	281.45	281.3	280.75	281.8	281.85	281.9	282.85	281.75
8	280.3	279.2	279.5	281.5	281.35	280.7	281.85	281.7	281.85	283.2	281.75
9	280.25	279.25	279.4	281.5	281.3	280.7	282.0	281.45	282.3	283.05	281.8
10	280.2	279.45	279.4	281.5	281.2	280.6	282.0	281.35	282.5	283.2	282.0
11	280.2	279.5	279.35	281.35	281.2	280.85	282.0	281.25	282.6	283.0	283.2
12	280.2	279.5	279.3	281.2	281.1	281.1	282.0	281.15	282.2	283.65	283.35
13	280.2	279.4	279.25	281.2	281.1	281.3	282.05	281.0	282.2	283.45	283.2
14	280.2	279.55	279.25	281.2	281.1	281.75	282.25	281.4	282.1	283.25	283.25
15	280.25	279.65	279.3	281.2	281.1	282.05	282.55	281.65	281.9	282.7	283.0
16	280.2	279.4	279.3	281.2	281.05	282.0	282.75	281.7	281.9	282.4	282.65
17	280.35	279.2	279.4	281.1	281.0	281.85	282.8	281.5	282.35	282.65	282.4
18	280.25	279.2	279.4	281.1	281.0	281.75	282.85	281.35	282.75	282.6	282.25
19	280.2	279.3	279.4	281.0	281.55	281.7	282.75	281.2	282.45	282.4	282.45
20	280.2	279.3	279.5	281.0	281.5	281.6	282.75	281.15	282.4	282.25	282.4
21	280.1	279.15	279.75	281.25	281.5	281.5	282.65	281.35	282.3	282.05	282.35
22	280.0	279.05	279.9	281.25	281.5	281.5	282.5	281.2	282.2	281.9	282.3
23	279.95	278.9	280.35	281.2	281.5	281.95	282.65	281.2	282.1	281.8	282.3
24	279.85	278.8	281.15	281.1	281.5	282.25	282.75	281.25	281.95	281.75	282.3
25	279.65	278.95	281.05	281.1	281.4	282.3	283.25	281.2	281.8	281.95	282.3
26	279.5	279.1	281.3	281.0	281.4	282.45	283.15	281.2	281.7	281.95	282.55
27	279.4	279.4	282.15	281.15	281.3	282.25	283.0	281.2	281.85	281.8	282.25
28	279.4	279.6	282.25	281.2	281.15	282.05	282.9	281.15	282.3	281.7	282.05
29	279.35	279.4	281.55	281.05	281.25	281.95	282.75	.....	282.8	281.85	281.9
30	279.4	279.15	281.6	281.0	281.4	282.0	282.45	.....	282.3	281.75	281.7
31	279.5	279.2	.....	281.35	.....	282.1	282.35	.....	282.15	.....	281.55

NOTE.— Station discontinued May 31, 1919.

ESOPUS CREEK

DESCRIPTION

Esopus creek has its source in Winnisook lake on the north-western slope of Slide mountain, the highest peak of the Catskills. From Big Indian to Ashokan reservoir the stream flows through a deep valley, flanked on both sides by timber-covered mountains. Numerous sites for dams or storage reservoirs are offered at points where the valley broadens out for a short distance to receive the inflowing waters of tributaries. The stream channel is relatively broad and shallow. The bed is covered with cobbles and small boulders left behind after the erosion of drift deposits, which formerly filled the valley. The drainage basin of Esopus creek is shown on the Margaretville, Phoenicia, Kaaterskill, Catskill, Slide Mountain, Rosendale and Rhinebeck sheets of the U. S. Geological Survey topographic maps. This stream is of great economical importance, owing to its relatively large yield and its location. The Ashokan reservoir, with a water-surface of 12 square miles and a total drainage area above the dam of 257 square miles, is one of the sources of water-supply for New York city.

Drainage areas of ESOPUS CREEK *

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
<i>Beaver Kill (Mink Hollow)</i>		
Source to about $\frac{1}{2}$ mile north of Lake Hill.....	8.42	8.42
ESOPUS CREEK		
Source to Coldbrook, at highway bridge.....	183.72	192.14
Coldbrook to Olive Bridge dam.....	64.38	256.52
Olive Bridge dam to pulp-mill, about $1\frac{1}{2}$ miles south of Brown's Station.....	7.01	263.53
Pulp-mill to Kingston, at highway bridge.....	53.54	317.07
<i>Saw Kill</i>		
Source to about $4\frac{1}{2}$ miles below Woodstock.....	2.99	.....
ESOPUS CREEK		
Kingston to Leggs Mills, about $\frac{1}{2}$ mile northwest of Lake Katrine railroad station.....	19.72	369.78
<i>Plattekill Creek</i>		
Source to below pond, about 2 miles east of West Saugerties.....	17.35	387.13
ESOPUS CREEK		
Leggs Mills to Glenerie, about 1 mile south of Mount Marion station at dam below W. S. R. R. bridge.....	28.95	416.08
Glenerie to Mount Marion, at highway bridge.....	2.13	418.21
Mount Marion to Saugerties, at dam below highway bridge.....	6.00	424.21

* This table of drainage areas is the result of a joint determination of areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

ESOPUS CREEK AT COLDBROOK

Location.—At highway bridge about 1,000 feet above Coldbrook railroad station on U. & D. R. R.; about 6 miles west of Ashokan.

Drainage area.—192 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—August 27, 1913, to June 30, 1919.

Gages.—Standard B. W. S. chain gage, read twice daily. On June 15, 1916, a Friez automatic register was installed. These gages are located on the downstream side of the highway bridge.

Discharge measurements.—At low stages, made by wading; at high stage, from the highway bridge (clear span of 160 feet).

Control.—Coarse gravel, apparently permanent, and numerous small boulders and some riprap. Channel above station straight for about three hundred feet; water swift. Channel below station straight for about one thousand feet; water swift. Right bank high, grassed and largely covered with brush, not liable to overflow. Left bank high, wooded, not liable to overflow.

Extremes of discharge.—Current year: Maximum stage, 8.95 feet on March 28 at 2 A. M.; discharge, 6,220 second-feet. Minimum stage recorded, 3.09 feet on August 28; discharge, 16 second-feet.

1913–1919: Maximum stage recorded, 12.75 feet on November 9, 1913, at 8 P. M.; discharge, about 21,400 second-feet. Minimum stage recorded, 3.21 feet on October 14, 1914; discharge, 8 second-feet.

Winter flow.—Discharge relation seriously affected by ice. Flow determined by meter and float measurements and climatological data.

Accuracy.—Discharge rating curve well defined up to a gage height of 10 feet.

Coöperation.—Established and maintained by the Board of Water Supply of the city of New York. Turbidity and climatological observations are made at this station.

GAGING OF STREAMS: HUDSON RIVER BASIN 357

Daily discharge, in second-feet, of ESOPUS CREEK AT COLDBROOK, for the year ended
June 30, 1919. Philip Dwyer and J. H. Joyce, Observers

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	138	41	232	183	216	174	470	238	1,730	e850	360	355
2.....	126	34	84	158	201	171	m674	235	1,001	e695	511	319
3.....	124	33	66	163	189	166	613	228	716	680	393	283
4.....	134	38	56	148	183	166	535	222	607	681	400	241
5.....	116	54	40	136	174	155	460	207	m625	688	434	222
6.....	124	31	45	177	166	143	440	195	667	730	400	219
7.....	129	26	41	186	163	136	415	m186	559	854	400	210
8.....	110	23	40	163	160	174	410	183	485	1,064	380	180
9.....	m98	26	45	155	158	180	365	160	1,590	1,019	425	195
10.....	91	30	34	148	140	158	299	145	1,833	888	888	180
11.....	89	77	30	145	131	138	295	131	1,240	965	1,500	m166
12.....	91	49	30	136	127	166	235	150	929	1,800	1,540	148
13.....	98	m38	52	131	120	153	279	153	758	1,390	1,500	138
14.....	94	36	45	127	114	213	360	207	613	1,120	1,250	148
15.....	94	31	38	120	112	565	287	213	511	m920	992	222
16.....	84	27	34	114	110	517	255	186	495	1,046	m816	216
17.....	91	24	24	118	123	470	238	158	505	1,800	1,330	180
18.....	84	23	79	112	299	425	225	143	983	1,400	1,340	163
19.....	71	m23	96	106	323	385	219	123	896	1,140	1,035	155
20.....	71	21	84	114	279	347	207	145	793	929	888	158
21.....	66	19	189	134	245	331	198	136	786	779	1,019	174
22.....	61	21	136	127	m238	430	195	150	772	653	1,700	140
23.....	64	28	108	110	245	1,309	210	138	667	565	m1,987	118
24.....	73	m23	94	110	216	1,130	583	143	607	589	1,510	116
25.....	m66	30	94	108	207	1,700	415	131	541	535	1,190	106
26.....	59	19	607	110	186	1,210	390	259	495	490	929	m123
27.....	54	17	695	106	177	896	360	183	646	440	751	365
28.....	44	16	365	106	177	718	339	201	3,005	415	613	311
29.....	46	m24	265	100	235	601	m323	.....	1,670	895	517	207
30.....	51	26	201	110	204	541	307	.....	e1,200	351	445	183
31.....	51	87	.....	m228	.....	475	275	.....	e1,000	.....	400	.....
Mean...	88	32	132	135	187	462	351	177	933	862	899	198

m Meter measurement.

e Estimated.

Monthly discharge of ESOPUS CREEK AT COLDBROOK, for the year ended June 30,
1919

[Drainage area, 192 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	
July.....	138	44	88	0.45	0.530
August.....	87	16	32	0.17	0.196
September.....	695	30	132	0.69	0.770
October.....	228	100	135	0.70	0.807
November.....	323	110	187	0.97	1.082
December.....	1,700	136	462	2.41	2.778
January.....	674	195	351	1.83	2.110
February.....	259	123	177	0.92	0.958
March.....	3,005	485	933	4.86	5.603
April.....	1,800	351	862	4.49	5.009
May.....	1,987	360	899	4.68	5.396
June.....	365	106	198	1.03	1.149
The year.....	3,005	16	371	1.93	26.386

RONDOUT CREEK

DESCRIPTION

Rondout creek has its source in the heart of the timber-covered mountain group forming Wittenberg chain. It flows southeasterly to Napanoch, where it encounters the foot of Shawangunk range, turns abruptly to the northeast and enters the Hudson river at Rondout. Its watershed on the south is very restricted, as it is separated from the Wallkill river by only the narrow Shawangunk ridge. Notable waterfalls occur at Honk falls and Napanoch over Hudson river shale, and on Good Beer kill above Ellenville. At Honk falls a natural declivity afforded a fall of 125 feet, which has been increased to 147.5 feet by the construction of a masonry dam at the head of the gorge. On Good Beer kill there is a total fall of 870 feet from the Cape, 3 miles above Ellenville, to Ellenville. Of this about 200 feet are concentrated in a series of cascades, called Hanging Rock falls.

Water-power was originally developed at Napanoch in 1754. There is in this village a total fall of 115 feet. A series of cascades, involving a descent of about 50 feet, occurs at High Falls, where the water flows over Rosendale cement rock.

Drainage areas of RONDOUT CREEK *
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
Source to Lackawack dam site, at Lackawack.....	94.73	94.73
Lackawack dam site to Lackawack gage, at Wilbur's bridge.....	5.63	100.36
Lackawack gage to Honk falls, about 1 mile above Napanoch.....	1.68	102.04
Honk falls to Alligerville, at highway bridge (including Vernoooy).....	243.78	345.82
Alligerville to High Falls, at High Falls dam.....	19.31	365.13
High Falls to Rosendale, at highway bridge.....	21.17	386.30

* This table is the result of a joint determination of drainage areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

RONDOUT CREEK AT LACKAWACK

Location.—At highway bridge, known as Wilbur's bridge, about 3 miles from Lackawack on road to Napanoch (reached by Ontario and Western railroad from Kingston to Napanoch and then a distance of 4 miles by Grahamsville stage).

Drainage area.—100 square miles,* determined from U. S. G. S. topographic maps and by special survey of part of watershed line by Board of Water Supply. (1910–1912, inclusive, drainage area considered 104 square miles, based on incomplete data.)

Records available.—May 1, 1910, to June 30, 1918. (Honk falls† records available, February 13, 1906, to April 30, 1910, inclusive.)

Gage.—Standard Board of Water Supply chain gage and Friez automatic stage register, read twice daily.

Discharge measurements.—At high stages, from highway bridge. At low stages, by wading at a point about a mile below Wilbur's bridge, where bottom is gravelly.

Control.—Sandy bottom from Sta. 0 to 45. Station 45 to 85 strewn with boulders. Section apparently permanent. Clear span, 85 feet. Channel above station straight for about 3,000 feet; water swift. Channel below station straight for about 1,000 feet; water swift. Right bank high, wooded. Left bank high, clean.

Extremes of discharge.—Current year: Maximum stage recorded, 6.83 feet on March 1, at 8 A. M.; discharge, 2,710 second-feet. Minimum stage recorded, 2.11 feet on August 18, 21, 27 and 28; discharge, 14 second-feet.

1910–1919: Maximum stage recorded, 10.40 feet on November 9, 1913, at 7:30 P. M.; discharge, 14,000 second-feet. Minimum stage recorded, 2.07 feet on October 8, 1914, and 2.11 feet on August 18, 21, 27 and 28, 1918; discharge, 14 second-feet.

Winter flow.—Discharge relation seriously affected by ice when channel is completely frozen over. Flow determined by meter measurements and climatological data.

Accuracy.—Discharge rating curve well defined.

Coöperation.—Established and maintained by Board of Water Supply of the city of New York. Climatological observations are made at this station.

* The 100 square miles used above is checked by the result of a joint determination of drainage areas, based on independent computations by engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

† Honk Falls is a short distance below this station.

Daily discharge, in second-feet, of RONDOUT CREEK AT LACKAWACK, for the year ended June 30, 1919. Frank J. Thoneman, Observer

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	82	80	208	134	177	125	294	154	806	345	204	147
2.....	87	m24	68	124	152	114	690	145	418	306	444	136
3.....	66	21	40	124	140	114	453	149	306	294	281	134
4.....	59	20	30	114	138	114	366	145	273	313	235	116
5.....	57	27	24	108	140	111	287	143	290	306	223	109
6.....	48	27	28	185	132	109	303	m134	319	284	213	109
7.....	57	23	35	185	124	109	290	127	259	264	211	121
8.....	50	19	25	141	121	117	267	127	235	262	213	101
9.....	43	19	29	129	117	129	246	125	716	259	211	113
10.....	m45	19	m23	119	116	122	208	113	788	251	546	113
11.....	48	35	21	106	113	116	206	106	512	m264	617	87
12.....	54	42	20	97	108	124	158	117	395	581	444	78
13.....	61	27	25	100	106	125	187	114	342	891	m402	72
14.....	68	24	29	97	106	177	204	181	m297	332	345	71
15.....	81	31	29	87	103	711	181	196	248	306	303	138
16.....	57	25	31	82	100	440	159	163	264	536	276	218
17.....	51	20	26	78	97	326	158	125	294	824	517	136
18.....	57	14	57	76	294	267	161	116	602	541	586	m113
19.....	47	17	97	72	251	230	167	100	466	426	406	93
20.....	57	15	72	75	196	211	158	103	395	362	352	84
21.....	40	14	154	213	173	194	152	101	373	326	338	89
22.....	37	m16	98	136	163	352	150	103	332	287	390	71
23.....	33	15	71	116	154	1,150	178	106	278	262	414	65
24.....	31	17	59	106	145	818	522	109	259	329	355	58
25.....	33	15	48	103	141	1,081	m264	111	238	322	342	54
26.....	31	15	586	109	m136	654	235	256	223	267	281	59
27.....	27	14	565	116	134	462	216	165	259	243	251	147
28.....	24	14	259	116	121	373	199	147	1,134	225	228	139
29.....	24	20	185	111	167	306	192	.....	591	225	211	89
30.....	31	27	150	225	143	270	183	.....	479	206	192	76
31.....	87	33	.....	238	.....	243	175	.....	410	.....	178	.....
Mean...	49	22	103	123	143	316	245	135	413	338	329	104

m Meter measurement.

NOTE.—Flow based on meter measurements and climatological data.

Monthly discharge of RONDOUT CREEK AT LACKAWACK, for the year ended June 30, 1919

(Drainage area, 100 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	87	24	49	0.49	0.565
August.....	42	14	22	0.22	0.254
September.....	586	20	103	1.03	1.149
October.....	238	72	123	1.23	1.418
November.....	284	97	143	1.43	1.565
December.....	1,150	109	316	3.16	3.583
January.....	690	150	245	2.45	2.826
February.....	256	100	135	1.35	1.406
March.....	1,134	223	413	4.13	4.761
April.....	824	206	338	3.38	3.771
May.....	617	173	329	3.29	3.793
June.....	218	54	104	1.04	1.160
The year.....	1,150	14	193	1.93	26.340

RONDOUT CREEK AT ROSENDALE

Location.—Rosendale highway bridge, downstream side. Reached by Wallkill Valley railroad from Kingston.

Drainage area.—386 square miles,* determined from U. S. G. S. topographic maps and by special survey of part of watershed line by Board of Water Supply. (1907 to 1912, inclusive, area considered 380 square miles, based on government records for year 1903.)

Records available.—January 1, 1907, to June 30, 1919.†

Gage.—Standard Board of Water Supply chain gage, read twice daily.

Discharge measurements.—At high stages, from highway bridge. At low stages, by wading at point about 1 mile below bridge, where river bed is gravelly.

Control.—River bed smooth, ledge-rock bottom. Clear span of 136 feet. Channel above and below station straight for about 300 feet. Banks high, rocky and slightly wooded, not liable to overflow.

Extremes of discharge.—Current year: Maximum stage recorded, 10.87 feet on December 23, as observed on chain gage at 7:30 A. M.; discharge, 4,900 second-feet. Minimum stage recorded, 5.94 feet on August 10; discharge, 45 second-feet.

1907–1919: Maximum stage recorded, 18.57 feet on April 26, 1910, at 4:30 P. M.; discharge, 21,600 second-feet. Minimum stage recorded, 5.77 feet on August 30 and September 1 to 3, 1907; discharge, 20 second-feet.

Winter flow.—Discharge relation seriously affected by ice. Flow determined by meter measurements and climatological data.

Diversion.—The Delaware and Hudson canal, which is abandoned above High Falls, draws its supply of water from the natural flow of Rondout creek at a point above Rosendale. A 3-foot staff gage is read at Rock Locks when water of Delaware and Hudson canal is discharged through rock channel, 3.4 feet wide, formed by masonry wall of lock near entrance and left bank wall. Stop-planks are placed to form weir, and discharge is com-

* The 386 square miles used above is checked by the result of a joint determination of drainage areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

† Established July 6, 1901, by the United States Geological Survey in cooperation with the New York City Water Supply Departments and taken over by the Board of Water Supply, June 1, 1907.

puted by weir formula and added to Rosendale bridge discharge for final record. From time to time measurements are made to check weir discharge. Canal is operated only during summer months, on a small scale.

Regulation.—At Honk falls dam, above Napanoch, and at High Falls, where power-houses are located, operations affect the natural flow of the creek.

Accuracy.—Discharge rating curve fairly well defined.

Coöperation.—Maintained by Board of Water Supply of the city of New York. Climatological observations are made at this station.

Daily discharge, in second-feet, of RONDOUT CREEK AT ROSENDALE, for the year ended June 30, 1919. Edward J. Huben, Observer

DAY	July†	Aug.†	Sept.†	Oct.†	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	116	123	263	311	530	311	751					
2.....	226	m 73	228	235	355	325	1,961					
3.....	187	77	151	311	298	340	1,595					
4.....	133	71	119	259	332	394	1,328					
5.....	113	96	101	203	340	318	801					
6.....	127	61	91	186	272	259	976					
7.....	158	58	84	624	235	229	835					
8.....	92	73	73	329	235	272	801					
9.....	233	54	75	258	272	311	801					
10.....	m 186	45	m 65	264	229	259	751					
11.....	145	59	63	224	178	259	734					
12.....	164	58	58	208	152	218	570					
13.....	123	51	73	187	224	362	650					
14.....	254	65	77	204	253	602	692					
15.....	377	63	65	257	259	2,242	650					
16.....	242	73	58	235	229	1,695	570					
17.....	180	58	54	200	207	1,136	538					
18.....	199	52	73	197	961	892	586					
19.....	188	58	100	192	1,185	717	570					
20.....	149	54	168	173	667	618	554					
21.....	116	51	357	144	554	586	488					
22.....	94	m 52	338	365	496	562	471					
23.....	124	51	162	291	402	4,268	454					
24.....	91	52	187	202	340	1,917	2,137					
25.....	133	48	131	235	362	4,268	1,056					
26.....	92	54	184	235	370	2,350	900					
27.....	77	52	1,914	218	m 370	2,027	801					
28.....	84	51	806	174	235	1,211	658					
29.....	63	54	488	224	386	908	618					
30.....	61	69	386	247	355	843	562					
31.....	137	91	.....	386	.....	726	530					
Mean...	150	63	233	251	381	1,017	819					

m Meter measurement. † Includes flow of D. & H. canal. ‡ Ice conditions.
 Note.—Water was let into D. & H. canal on April 28, 1918, and discharged October 23, 1918.
 Flow under ice conditions based on meter measurements and climatological data. Station discontinued January 31, 1919.

GAGING OF STREAMS: HUDSON RIVER BASIN 363

Monthly discharge of RONDOUT CREEK AT ROSENDALE, for the year ended June 30, 1919

[Drainage area, 386 square miles]

MONTH	DISCHARGE IN SECOND-FeET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	377	61	150	0.39	0.450
August.....	123	45	63	0.16	0.184
September.....	1,914	54	233	0.60	0.689
October.....	624	144	251	0.65	0.749
November.....	1,185	152	381	0.99	1.104
December.....	4,268	229	1,017	2.63	3.032
January.....	2,137	454	819	2.12	2.444

NOTE.— Station discontinued January 31, 1919.

HUDSON RIVER BASIN—MISCELLANEOUS MEASUREMENTS

Miscellaneous measurements in HUDSON RIVER DRAINAGE BASIN, for the year ended June 30, 1919

DATE	STREAM	LOCALITY	GAGE HEIGHT	DIS-CHARGE
1918			Feet	Sec.-ft.
Aug. 22....	Battenkill.....	Greenwich.....	.....	67.7
Oct. 28....	Power canal.....	Cohoes Power Co.'s plant.....	.....	2,830
1919				
May 7....	Cedar river.....	Indian Lake.....	3.64	130
June 19....	Hudson river.....	Lake Harris.....	.....	306

DELAWARE RIVER DRAINAGE BASIN**DELAWARE RIVER****DESCRIPTION**

The headwaters of Delaware river are found in Delaware, Greene and Schoharie counties. The East branch, which may be considered the main stream, rises at Grand Gorge in northeastern Delaware county; the West branch has its source in a small lake almost on the line of Schoharie and Delaware counties, at an elevation of 1,886 feet above sea-level; the two streams unite at Hancock, forming what is referred to as the Delaware river, while above this point the two branches are designated as East or West branch, Delaware river. From this junction point the river flows southeastward until it reaches Port Jervis, where it turns to the southwest and flows for a distance of about 40 miles along the base of the Shawangunk range until it passes through the water gap, from which point it flows in an irregular southerly direction to Trenton, N. J. Below Trenton its course is in general southwestward to Delaware bay. Between Hancock and Port Jervis it forms the dividing line between New York and Pennsylvania; south of Port Jervis it separates Pennsylvania from New Jersey and, for a few miles, Delaware from New Jersey.

The drainage area of Delaware river, measured at Philadelphia, Pa., and including that of Schuylkill river, is about 10,100 square miles, of which about 2,580 square miles lie in New York, 5,720 in Pennsylvania, and 1,800 in New Jersey. The river is tidal to Trenton, which lies also at the head of navigation.

The Delaware receives a number of important tributaries, among which may be mentioned Mongaup and Neversink rivers and Callicoon creek from New York; Lackawaxen, Lehigh and Schuylkill rivers and numerous creeks from Pennsylvania; and Rancocas creek, Musconetcong river and Maurice river from New Jersey.

EAST BRANCH OF DELAWARE RIVER AT FISH EDDY

Location.—At the railway bridge in the village of Fish Eddy, Delaware county, about 4 miles below the mouth of Beaver kill and $5\frac{1}{2}$ miles above the confluence of East and West branches.

Drainage area.—790 square miles. (Measured on post-route map.)

Records available.—November 19, 1912, to June 30, 1919. Records were obtained at Hancock, about 4 miles below, from October 14, 1902, to December 31, 1912.

Gage.—Staff in two sections on downstream and on left pier of railroad bridge; read by J. P. Lyons.

Discharge measurements.—Made from the highway bridge about 200 feet above the gage or by wading.

Channel and control.—Coarse gravel; occasionally shifting.

Extremes of discharge.—Current year: Maximum stage recorded, 8.4 feet at 4 P. M., April 12; discharge, 8,390 second-feet. Minimum stage recorded, 1.7 feet several times in August and September; discharge, 141 second-feet.

1912–1919: Maximum stage, 17.4 feet during the afternoon of March 27, 1913, determined by leveling from flood-marks; discharge, about 33,500 second-feet. Minimum stage recorded, 1.64 feet at 5 P. M., October 12, 14 and 15, 1914; discharge, 97 second-feet.

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation apparently permanent; usually affected by ice during much of the period from December to March, inclusive. Rating curve well defined between 200 and 20,000 second-feet. Gage read to hundredths twice daily. Discharge ascertained by applying mean daily gage height to rating table. Records good except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the U. S. Weather Bureau and the State Engineer and Surveyor.

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Discharge measurements of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY,
during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 15.....	E. D. Burchard.....	2.08	243
1919			
Mar. 15.....	J. W. Moulton.....	4.25	1,770
May 8.....	J. W. Moulton.....	3.92	1,480

Daily gage height, in feet, of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY,
for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.7	2.0	2.3	3.3	3.5	2.9	4.6	3.4	5.5	a	4.6	2.9
2.....	2.6	2.0	2.4	3.2	3.5	2.9	6.9	3.3	5.6	a	4.7	2.8
3.....	2.6	2.0	2.2	3.0	3.5	2.9	6.0	3.3	5.0	4.2	4.6	2.75
4.....	2.5	2.0	2.05	3.0	3.45	2.8	5.1	3.2	4.7	4.6	4.4	2.75
5.....	2.4	2.0	2.0	3.0	3.4	2.65	4.9	3.2	4.7	5.4	4.2	2.7
6.....	2.4	2.0	1.85	5.3	3.4	2.5	4.6	3.1	4.6	5.8	4.2	2.7
7.....	2.4	1.95	1.80	5.0	3.3	2.5	4.4	3.0	4.6	5.7	4.0	2.65
8.....	2.4	1.95	1.78	4.6	3.3	2.5	4.3	2.8	4.4	5.6	3.9	2.65
9.....	2.4	1.90	1.70	4.4	3.2	2.6	4.3	2.7	5.5	5.5	4.7	2.6
10.....	2.45	1.90	1.70	4.1	3.1	2.7	4.2	2.65	5.4	5.6	5.6	2.6
11.....	2.6	1.90	1.70	4.0	3.1	2.8	4.2	2.6	4.8	6.2	6.5	2.6
12.....	2.5	1.90	1.70	3.8	2.95	2.8	4.2	2.55	4.4	8.3	6.4	2.6
13.....	2.25	2.00	1.70	3.8	2.8	3.2	4.2	2.55	4.2	7.9	6.3	2.5
14.....	2.15	2.0	1.70	3.8	2.7	3.8	4.1	3.5	4.2	6.4	6.2	2.5
15.....	2.15	2.05	1.70	3.6	2.7	5.7	4.1	3.3	4.2	6.3	5.5	3.6
16.....	2.2	2.0	1.70	3.45	2.7	5.2	3.9	3.3	4.2	6.4	5.0	3.8
17.....	2.45	1.90	1.80	3.3	2.8	4.8	3.7	3.2	4.4	6.6	4.8	3.3
18.....	2.6	1.85	1.80	3.2	3.1	4.7	3.5	2.85	5.8	6.2	5.4	3.2
19.....	2.5	1.82	1.90	3.2	3.1	4.6	3.5	2.8	5.7	6.2	5.1	2.95
20.....	2.4	1.80	2.1	3.3	3.1	4.2	3.5	2.8	5.6	5.8	5.0	2.75
21.....	2.3	1.80	2.55	3.4	3.0	3.8	3.4	2.75	5.4	5.2	4.8	2.7
22.....	2.3	1.75	2.85	3.5	3.0	3.8	3.4	2.7	5.2	5.2	5.0	2.65
23.....	2.25	1.75	2.5	3.5	3.0	7.4	3.6	2.65	4.7	4.4	5.4	2.5
24.....	2.2	1.70	2.4	3.6	3.0	7.8	5.3	2.65	4.5	4.3	5.1	2.2
25.....	2.2	1.70	2.55	3.7	3.0	5.6	4.6	2.65	4.5	4.2	4.6	2.2
26.....	2.2	1.70	2.5	3.6	3.0	5.2	4.2	2.65	4.4	4.0	4.3	2.2
27.....	2.15	1.70	5.8	3.5	3.0	4.7	3.8	2.65	6.0	4.0	4.2	2.6
28.....	2.1	1.70	4.4	3.5	2.95	4.6	3.6	2.8	6.2	3.9	4.2	3.2
29.....	2.0	1.70	4.0	3.5	2.9	4.4	3.5	.....	5.9	3.9	4.1	2.75
30.....	2.0	1.70	3.4	3.5	2.9	4.3	3.4	.....	4.9	4.1	3.9	2.65
31.....	2.0	1.80	.....	3.5	.....	4.3	3.4	.....	4.8	.....	3.35	.....

a No record.

GAGING OF STREAMS: DELAWARE RIVER BASIN 367

Daily discharge, in second-feet, of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY,
for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	530	228	340	920	1,080	650	2,100	1,000	3,180	2,200	2,100	650
2.....	480	228	385	850	1,080	650	5,440	920	3,320	2,000	2,210	590
3.....	480	228	300	710	1,080	650	3,910	920	2,550	1,690	2,100	560
4.....	430	228	245	710	1,040	590	2,670	850	2,210	2,100	1,890	560
5.....	385	228	228	710	1,000	505	2,430	850	2,210	3,050	1,690	530
6.....	385	228	183	2,920	1,000	430	2,100	780	2,100	3,610	1,690	530
7.....	385	213	168	2,550	920	430	1,890	710	2,100	3,460	1,500	505
8.....	385	213	163	2,100	920	430	1,790	590	1,890	3,320	1,410	505
9.....	385	198	141	1,890	850	480	1,790	530	3,180	3,180	2,210	480
10.....	408	198	141	1,590	780	530	1,690	505	3,050	3,320	3,320	480
11.....	480	198	141	1,500	780	590	1,690	480	2,320	4,230	4,730	480
12.....	430	198	141	1,320	680	590	1,690	455	1,890	8,180	4,560	480
13.....	320	228	141	1,320	590	850	1,690	455	1,690	7,360	4,390	430
14.....	281	228	141	1,320	530	1,320	1,590	1,080	1,690	4,560	4,230	430
15.....	281	245	141	1,160	530	3,460	1,590	920	1,690	4,390	3,180	1,160
16.....	300	228	141	1,040	530	2,790	1,410	920	1,690	4,560	2,550	1,320
17.....	408	198	168	920	590	2,320	1,240	850	1,890	4,900	2,320	920
18.....	480	183	168	850	780	2,210	1,080	620	3,610	4,230	3,050	850
19.....	430	174	198	850	780	2,100	1,080	590	3,460	4,230	2,670	680
20.....	385	168	262	920	780	1,690	1,080	590	3,320	3,610	2,550	560
21.....	340	168	455	1,000	710	1,320	1,000	560	3,050	2,790	2,320	530
22.....	340	154	620	1,080	710	1,320	1,000	530	2,790	2,790	2,550	505
23.....	320	154	430	1,080	710	6,380	1,160	505	2,210	1,890	3,050	430
24.....	300	141	385	1,160	710	7,160	2,920	505	1,990	1,790	2,670	300
25.....	300	141	455	1,240	710	3,320	2,100	505	1,990	1,690	2,100	300
26.....	300	141	430	1,160	710	2,790	1,690	505	1,890	1,500	1,790	300
27.....	281	141	3,610	1,080	710	2,210	1,320	505	3,910	1,500	1,690	480
28.....	262	141	1,890	1,080	680	2,100	1,160	590	4,230	1,410	1,690	850
29.....	228	141	1,500	1,080	650	1,890	1,080	.....	3,760	1,410	1,590	560
30.....	228	141	1,000	1,080	650	1,790	1,000	.....	2,430	1,590	1,410	505
31.....	228	168	.....	1,080	.....	1,790	1,000	.....	2,320	.....	960	.....
Mean...	360	189	490	1,230	776	1,780	1,790	672	2,570	3,220	2,460	582

NOTE.—Stage-discharge relation not affected by ice. Gage height estimated by observer, October 20 to 26. Discharge estimated, April 1 and 2, by comparing hydrograph of West branch of Delaware river at Hale Eddy.

Monthly discharge of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, for the
year ended June 30, 1919
[Drainage area, 790 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	530	228	360	0.456	0.53
August.....	245	141	189	0.239	0.28
September.....	3,610	141	490	0.620	0.69
October.....	2,920	710	1,230	1.56	1.80
November.....	1,080	530	776	0.980	1.09
December.....	7,160	430	1,780	2.25	2.59
January.....	5,440	1,000	1,790	2.27	2.62
February.....	1,080	455	672	0.851	0.89
March.....	4,230	1,690	2,570	3.25	3.75
April.....	8,180	1,410	3,220	4.08	4.55
May.....	4,730	960	2,460	3.11	3.58
June.....	1,320	300	582	0.737	0.82
The year.....	8,180	141	1,843	1.70	23.19

DELAWARE RIVER AT PORT JERVIS

Location.—At the toll bridge at Port Jervis, Orange county, 1 mile above Neversink river and 6 miles below Mongaup river.

Drainage area.—3,250 square miles.

Records available.—October 12, 1904, to June 30, 1919.

Gage.—Staff, in two sections, the lower section inclined, about 30 feet downstream, from left abutment of bridge; the upper section vertical and attached to downstream end of left abutment. Read by John Bisland.

Discharge measurements.—Made from the highway bridge or by wading.

Channel and control.—Gravel; occasionally shifting.

Extremes of discharge.—Current year: Maximum stage recorded, 7.12 feet at 5 P. M., March 10; discharge, 21,300 second-feet. Minimum stage recorded, 1.10 feet at 8 A. M. and 5 P. M., August 26 and 28; discharge, 390 second-feet.

1904–1919: Maximum stage recorded, 16.0 feet at 8 A. M., March 28, 1914; discharge, 92,700 second-feet. Minimum stage recorded, 0.60 foot at 8 A. M., September 22 and 23, 1908; discharge, 175 second-feet.

Ice.—Stage-discharge relation somewhat affected by ice.

Accuracy.—Stage-discharge relation practically permanent between dates of shifting; affected by ice during large part of January and February. Rating curve well defined between 1,000 and 30,000 second-feet. Gage read to tenths once daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good for periods when the stage-discharge relation is not affected by ice and fairly good for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the U. S. Weather Bureau and the State Engineer and Surveyor.

GAGING OF STREAMS: DELAWARE RIVER BASIN 369

Discharge measurements of DELAWARE RIVER AT PORT JERVIS, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 13.....	E. D. Burchard.....	1.50	650
Aug. 13.....	E. D. Burchard.....	1.53	657
1919			
May 10.....	J. W. Moulton.....	3.80	5,310
June 25.....	C. C. Covert.....	2.12	1,360

Daily gage height, in feet, of DELAWARE RIVER AT PORT JERVIS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.5	1.6	1.65	2.9	4.5	2.7	3.9	3.2	4.3	4.4	3.6	3.1
2.....	2.3	1.7	1.7	2.8	4.1	2.5	4.4	3.3	6.3	4.1	3.8	2.9
3.....	2.5	1.6	1.9	2.7	3.7	2.45	5.6	2.7	5.4	4.0	4.3	2.8
4.....	2.4	1.55	1.75	2.8	3.5	2.45	5.1	2.6	4.8	3.9	4.0	2.7
5.....	2.25	1.6	1.6	2.9	3.1	2.45	4.4	2.8	4.5	4.4	3.7	2.6
6.....	2.0	1.5	1.6	3.0	3.5	2.35	3.8	2.8	4.5	4.6	3.6	2.5
7.....	2.0	1.45	1.5	5.7	3.3	2.3	3.9	2.6	4.5	4.7	3.5	2.7
8.....	2.1	1.5	1.45	4.7	3.3	2.25	4.2	2.4	4.2	4.7	3.5	2.7
9.....	2.2	1.5	1.4	4.0	2.9	2.4	4.2	2.4	4.5	4.9	3.5	2.7
10.....	2.1	1.55	1.3	3.6	2.8	2.5	3.9	2.3	7.0	4.8	4.3	2.5
11.....	2.1	1.55	1.25	3.4	2.7	2.35	3.4	2.2	6.1	4.5	6.2	2.45
12.....	2.15	1.5	1.25	3.3	2.7	2.35	3.3	2.2	5.5	6.3	6.0	2.4
13.....	2.15	1.6	1.25	3.2	2.6	2.6	3.1	2.2	5.1	6.8	5.7	2.3
14.....	2.2	1.6	1.35	3.1	2.5	2.8	3.1	2.45	4.6	5.9	5.5	2.2
15.....	2.3	1.8	1.65	2.9	2.45	3.4	3.2	3.1	4.2	5.4	5.0	2.2
16.....	2.45	1.8	1.6	2.8	2.4	4.7	3.4	3.6	4.2	4.1	4.7	3.1
17.....	2.25	1.6	1.5	2.7	2.35	4.4	3.2	3.4	4.6	6.4	4.6	3.1
18.....	2.2	1.5	1.5	2.6	2.7	4.0	3.2	3.2	5.2	6.2	5.1	3.0
19.....	2.2	1.35	1.7	2.45	3.3	3.6	3.2	2.8	5.8	5.5	4.8	2.8
20.....	2.2	1.25	1.85	2.4	3.5	3.3	3.1	2.45	5.2	5.2	4.4	2.5
21.....	2.2	1.2	2.25	2.3	3.3	3.3	2.9	2.45	4.8	4.7	4.3	2.5
22.....	2.0	1.15	2.8	2.3	3.1	3.3	2.9	2.4	4.7	4.6	5.5	2.6
23.....	1.95	1.1	2.6	2.8	2.9	4.8	2.9	2.6	4.5	4.3	4.6	2.4
24.....	1.8	1.1	2.4	2.7	2.8	5.6	3.9	2.6	4.3	4.1	4.9	2.2
25.....	1.7	1.1	2.2	2.5	2.8	5.9	4.7	2.6	4.1	4.1	4.6	2.1
26.....	1.6	1.1	2.2	2.5	2.7	6.1	4.2	2.8	3.9	4.1	4.4	2.3
27.....	1.6	1.2	4.2	2.6	2.6	5.2	4.1	2.9	3.7	3.9	4.1	2.3
28.....	1.5	1.1	4.4	2.6	2.5	4.7	3.8	2.8	4.5	3.8	3.9	2.5
29.....	1.5	1.2	3.7	2.6	2.6	4.4	3.6	....	5.1	3.8	3.6	2.5
30.....	1.5	1.2	3.2	2.6	2.7	4.3	3.5	....	4.6	3.8	3.4	2.45
31.....	1.7	1.2	....	3.0	....	3.9	3.4	....	4.6	....	3.2	....

Daily discharge, in second-feet, of DELAWARE RIVER AT PORT JERVIS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2,070	780	830	2,920	7,810	2,470	5,680	3,650	7,060	7,430	4,750	3,400
2.....	1,720	880	880	2,690	6,350	2,070	7,430	3,910	16,200	6,350	5,360	2,920
3.....	2,070	780	1,110	2,470	5,050	1,980	12,600	2,470	11,600	6,010	7,060	2,690
4.....	1,890	732	935	2,690	4,460	1,980	10,300	2,260	9,010	5,680	6,010	2,470
5.....	1,640	780	780	2,920	3,400	1,980	7,430	2,690	7,810	7,430	5,050	2,260
6.....	1,240	685	780	3,160	4,460	1,800	5,360	2,690	7,810	8,200	4,750	2,070
7.....	1,240	642	685	13,100	3,910	1,720	5,680	2,260	7,810	8,600	4,460	2,470
8.....	1,390	685	642	8,600	3,910	1,640	6,700	1,890	6,700	8,600	4,460	2,470
9.....	1,550	685	600	6,010	2,920	1,890	6,700	1,890	7,810	9,420	4,460	2,470
10.....	1,390	732	525	4,750	2,690	2,070	5,680	1,720	20,500	9,010	7,060	2,070
11.....	1,390	732	490	4,180	2,470	1,800	4,180	1,550	15,100	7,810	15,700	1,980
12.....	1,470	685	490	3,910	2,470	1,800	3,910	1,550	12,100	16,200	14,600	1,890
13.....	1,470	780	490	3,650	2,260	2,260	3,400	1,550	10,300	19,200	13,100	1,720
14.....	1,550	780	562	3,400	2,070	2,690	3,400	1,980	8,200	14,100	12,100	1,550
15.....	1,720	990	830	2,920	1,980	4,180	3,650	3,400	6,700	11,600	9,840	1,550
16.....	1,980	990	780	2,690	1,890	8,600	4,180	4,750	6,700	6,350	8,600	3,400
17.....	1,640	780	685	2,470	1,800	7,430	3,650	4,180	8,200	16,800	8,200	3,400
18.....	1,550	685	685	2,260	2,470	6,010	3,650	3,650	10,700	15,700	10,300	3,160
19.....	1,550	562	880	1,980	3,910	4,750	3,650	2,690	13,600	12,100	9,010	2,690
20.....	1,550	490	1,050	1,890	4,460	3,910	3,400	1,980	10,700	10,700	7,430	2,070
21.....	1,550	455	1,640	1,720	3,910	3,910	2,920	1,980	9,010	8,600	7,060	2,070
22.....	1,240	422	2,690	1,720	3,400	3,910	2,920	1,890	8,600	8,200	12,100	2,260
23.....	1,180	390	2,260	2,690	2,920	9,010	2,920	2,260	7,810	7,060	8,200	1,890
24.....	990	390	1,890	2,470	2,690	12,600	5,680	2,260	7,060	6,350	9,420	1,550
25.....	880	390	1,550	2,070	2,690	14,100	8,600	2,260	6,350	6,350	8,200	1,390
26.....	780	390	1,550	2,070	2,470	15,100	6,700	2,690	5,680	6,350	7,430	1,720
27.....	780	455	6,700	2,260	2,260	10,700	6,350	2,920	5,050	5,680	6,350	1,720
28.....	685	390	7,430	2,260	2,070	8,600	5,360	2,690	7,810	5,360	5,680	2,070
29.....	685	455	5,050	2,260	2,260	7,430	4,750	.....	10,300	5,360	4,750	2,070
30.....	685	455	3,650	2,260	2,470	7,060	4,460	.....	8,200	5,360	4,180	1,980
31.....	880	455	.....	3,160	.....	5,680	4,180	.....	8,200	.....	3,650	.....
Mean....	1,370	629	1,640	3,340	3,260	5,200	5,340	2,560	9,310	9,070	7,720	2,250

Monthly discharge of DELAWARE RIVER AT PORT JERVIS, for the year ended June 30, 1919

[Drainage area, 3,250 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	2,070	685	1,370	0.422	0.49
August.....	990	390	629	0.194	0.22
September.....	7,430	490	1,640	0.506	0.56
October.....	13,100	1,720	3,340	1.03	1.19
November.....	7,810	1,800	3,260	1.00	1.12
December.....	15,100	1,640	5,200	1.60	1.84
January.....	12,600	2,920	5,340	1.64	1.89
February.....	4,750	1,550	2,560	0.788	0.82
March.....	20,500	5,050	9,310	2.86	3.30
April.....	19,200	5,360	9,070	2.79	3.11
May.....	15,700	4,460	7,720	2.33	2.74
June.....	3,400	1,890	2,250	0.692	0.77
The year.....	30,800	890	4,807	1.33	15.05

BEAVER KILL

BEAVER KILL AT COOKS FALLS

Location.—At the covered highway bridge in Cooks Falls, Delaware county.

Drainage area.—236 square miles. (Measured on post-route and U. S. Geological Survey topographic maps.)

Records available.—July 25, 1913, to June 30, 1919.

Gage.—Vertical staff in two sections bolted to rock on left bank under the bridge; read by H. B. Couch.

Discharge measurements.—Made from the bridge or by wading a short distance downstream.

Channel and control.—Coarse gravel, boulders and solid ledge; practically permanent.

Extremes of discharge.—Current year: Maximum stage, 7.5 feet at 11 A. M., on July 22. Minimum stage recorded, 0.84 foot at 7 A. M. and 3 P. M., August 24.

1913–1919: Maximum stage recorded, 12.4 feet at 5 P. M., October 30, 1917; discharge, about 9,700 second-feet. Minimum stage recorded, 0.70 foot from 7 A. M., October 12, to 7 A. M., October 13, 1916; discharge, 30 second-feet.

Ice.—Stage-discharge relation somewhat affected by ice.

Accuracy.—Stage-discharge relation practically permanent; usually affected by ice during portions of the period December to March, inclusive. Rating curve well defined between 50 and 4,500 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when the stage-discharge relation was not affected by ice; fair for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BEAVER KILL AT COOKS FALLS, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 15.....	E. D. Burchard.....	1.39	129
Aug. 15.....	E. D. Burchard.....	1.39	128
1919			
Mar. 15 ^a	J. W. Moulton.....	2.88	522
May 9.....	J. W. Moulton.....	2.73	458

^a Anchor ice running.

Daily gage height in feet, of BEAVER KILL AT COOKS FALLS, for the year ended June
30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1.7	1.11	1.9	1.95	3.4	2.15	3.1	2.1	6.6	3.2	2.9	^a
2.....	1.7	1.06	1.39	1.9	3.0	2.0	5.1	2.1	4.0	3.0	3.9	2.15
3.....	1.55	1.02	1.11	2.5	2.9	2.0	4.0	2.1	3.3	3.1	3.4	2.1
4.....	1.6	1.00	1.03	2.15	2.7	2.0	4.0	2.25	3.2	3.4	^a	2.05
5.....	1.55	1.16	0.98	2.05	2.7	1.95	3.6	2.1	3.5	3.6	3.0	1.95
6.....	1.46	1.09	0.96	2.9	2.6	1.8	3.3	2.05	3.7	4.6	2.9	2.0
7.....	1.46	1.01	0.98	3.2	2.45	1.65	3.1	2.0	3.6	4.0	2.8	2.05
8.....	1.46	0.98	0.96	2.7	2.35	1.8	3.2	1.95	3.2	3.9	2.7	^a
9.....	1.44	0.98	0.96	2.4	2.25	2.0	3.0	1.9	5.5	3.8	2.8	1.9
10.....	1.55	0.98	0.92	2.25	2.2	1.85	2.9	1.85	5.0	3.6	4.1	1.8
11.....	1.6	1.37	0.94	2.15	2.15	1.9	2.7	1.65	4.2	3.9	4.4	1.7
12.....	1.55	1.33	0.94	2.1	2.1	2.0	2.7	1.8	3.7	6.0	4.0	1.65
13.....	1.65	1.23	1.08	2.1	2.05	1.9	2.45	1.85	3.4	4.3	3.9	1.6
14.....	1.95	1.09	0.97	2.1	2.0	2.0	2.35	2.0	3.3	4.2	3.5	1.55
15.....	2.15	1.38	0.93	2.0	1.95	4.1	2.5	2.3	2.9	3.9	3.4	^a
16.....	1.65	1.17	0.92	1.95	1.6	4.0	2.45	1.95	2.9	4.6	3.3	3.0
17.....	1.55	1.07	0.90	1.9	1.42	3.4	2.4	1.8	3.0	5.6	3.8	2.35
18.....	1.55	1.00	0.95	1.85	2.25	3.1	2.4	1.9	4.6	4.6	3.8	2.0
19.....	1.44	0.98	1.39	1.85	2.6	2.8	2.4	1.55	4.0	4.2	3.6	1.8
20.....	1.38	0.95	1.28	1.8	2.45	2.6	2.05	1.6	3.6	3.8	3.3	1.8
21.....	1.22	0.90	2.15	3.8	2.3	2.4	2.0	1.8	3.6	3.6	3.4	1.9
22.....	1.29	0.88	1.6	2.6	2.25	2.6	3.0	1.8	3.5	3.4	3.4	^a
23.....	1.25	0.86	1.43	2.4	2.1	6.2	2.0	1.7	3.4	3.2	3.9	1.55
24.....	1.22	0.84	1.35	2.25	2.1	4.4	4.0	1.7	3.3	3.1	3.4	1.5
25.....	1.21	1.34	1.29	2.15	2.05	6.0	3.1	1.55	3.1	3.1	3.2	1.48
26.....	1.19	1.01	2.8	2.2	2.05	4.8	3.0	2.2	3.0	3.5	3.1	1.49
27.....	1.16	0.92	3.6	2.3	2.0	4.2	2.7	1.8	3.0	3.1	2.9	2.4
28.....	1.12	0.88	2.7	2.25	2.0	3.8	2.5	1.8	5.0	3.1	2.7	2.3
29.....	1.14	1.06	2.2	2.2	2.4	3.4	2.45	.....	4.1	3.0	2.7	^a
30.....	1.13	1.01	2.0	2.4	2.3	3.2	2.4	.....	3.8	2.9	2.5	1.65
31.....	1.18	0.86	.....	4.0	.....	3.0	2.3	.....	3.4	.....	2.35	.....

^a No record.

GAGING OF STREAMS: DELAWARE RIVER BASIN 873

Daily discharge, in second-feet, of BEAVER KILL AT COOKS FALLS, for the year ended June 30, 1918

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	755	232	805	186	1,730	371	200	130	.....	1,240	760	415
2.....	1,200	232	530	186	1,400	355	190	130	.....	1,690	660	330
3.....	910	256	455	175	1,080	355	190	120	.....	1,690	570	287
4.....	615	244	455	244	805	325	190	120	.....	1,330	530	261
5.....	530	232	371	269	705	310	190	120	.....	1,180	490	261
6.....	455	232	296	208	615	282	190	110	.....	950	450	236
7.....	387	220	256	186	282	256	200	110	.....	850	415	315
8.....	355	232	256	175	404	244	190	110	.....	750	330	287
9.....	660	660	256	220	325	232	190	110	805	1,300	315	224
10.....	2,720	455	269	164	310	220	200	110	830	1,360	315	224
11.....	3,310	387	256	154	296	200	200	.....	805	1,180	315	200
12.....	2,960	244	232	310	282	200	200	.....	755	1,000	301	315
13.....	1,870	208	208	244	296	200	200	.....	855	850	315	361
14.....	805	186	186	340	296	200	200	.....	1,020	950	490	248
15.....	615	175	175	355	296	200	200	.....	755	1,240	615	224
16.....	530	910	164	310	269	190	200	.....	705	1,300	450	189
17.....	530	1,140	164	256	282	200	200	.....	855	1,120	415	178
18.....	530	530	144	232	325	200	200	.....	1,260	1,830	380	167
19.....	530	355	134	232	310	200	200	.....	1,730	1,300	345	167
20.....	455	810	124	530	296	200	190	.....	2,240	1,000	345	146
21.....	420	282	114	490	282	200	180	.....	2,720	1,690	380	136
22.....	340	387	114	325	404	200	180	.....	3,310	2,590	345	800
23.....	855	2,320	124	282	1,140	190	170	.....	2,960	1,620	345	362
24.....	660	1,080	114	530	615	186	170	.....	2,160	1,300	315	287
25.....	490	755	124	910	371	197	170	.....	1,940	1,060	301	224
26.....	420	455	114	570	355	197	160	.....	1,660	850	415	200
27.....	282	282	114	1,590	340	208	160	.....	1,400	750	380	167
28.....	256	1,520	164	1,260	325	197	160	.....	1,020	660	345	156
29.....	340	2,880	144	1,940	340	200	150	.....	910	660	287	156
30.....	310	910	186	7,110	387	200	140	.....	1,260	750	415	146
31.....	256	1,080	.....	2,400	.....	200	130	.....	1,260	.....	490	.....
Mean....	818	626	235	722	505	230	184	417	1,420	1,220	414	250

NOTE.— Discharge, December 11 to 23 and December 29 to February 10, estimated, because of ice, from discharge measurements, weather records, study of gage-height graph and comparison with similar studies for East branch of Delaware river at Fish Eddy. Mean discharge, February 11 to 28, inclusive, estimated, 584 second-feet. Mean discharge, March 1 to 8, inclusive, estimated, 1,370 second-feet. April 1 to September 30, data revised and supersede data previously published.

Monthly discharge of BEAVER KILL AT COOKS FALLS, for the year ended June 30, 1918

[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	3,310	256	818	3.47	4.00
August.....	2,880	175	626	2.65	3.06
September.....	805	114	235	0.996	1.11
October.....	7,110	154	722	3.06	3.53
November.....	1,730	269	505	2.14	2.39
December.....	371	175	230	0.975	1.12
January.....	200	130	184	0.780	0.90
February.....	.....	.....	417	1.77	1.84
March.....	3,310	705	1,420	6.02	6.94
April.....	2,590	660	1,220	5.17	5.77
May.....	750	287	414	1.75	2.02
June.....	800	136	250	1.06	1.18
The year.....	7,110	114	587	2.49	33.86

NOTE.— Estimates revised, April 1 to June 30, on basis of additional measurements and supersede data previously published.

Daily discharge, in second-feet, of BEAVER KILL AT COOKS FALLS, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	167	68	212	224	750	274	615	261	2,910	660	530	300
2.....	167	64	106	212	570	236	1,760	261	1,060	570	1,000	274
3.....	136	61	68	380	530	236	1,060	261	705	615	750	261
4.....	146	59	61	274	450	236	1,060	301	660	750	650	248
5.....	136	74	58	248	450	224	850	261	800	850	570	224
6.....	119	66	57	530	415	189	705	248	900	1,420	530	236
7.....	119	60	58	660	362	156	615	236	850	1,060	490	248
8.....	119	58	57	450	330	189	660	224	660	1,000	450	230
9.....	115	58	57	345	301	236	570	212	2,040	950	490	212
10.....	136	58	55	301	287	200	530	200	1,690	850	1,120	189
11.....	146	103	56	274	274	212	450	156	1,180	1,000	1,300	167
12.....	136	97	56	261	261	236	450	189	900	2,430	1,060	156
13.....	156	82	65	261	248	212	362	200	750	1,240	1,000	146
14.....	224	66	58	261	236	236	330	236	705	1,180	900	136
15.....	274	105	56	236	224	1,120	380	315	530	1,000	750	400
16.....	156	75	55	224	146	1,060	362	224	530	1,420	705	570
17.....	136	65	54	212	112	750	345	189	570	2,110	950	330
18.....	136	59	56	200	301	615	345	212	1,420	1,420	950	236
19.....	115	58	106	200	415	490	345	136	1,060	1,180	850	189
20.....	105	56	89	189	362	415	248	146	850	950	705	189
21.....	95	54	274	950	315	345	236	189	850	850	750	212
22.....	91	53	146	415	301	415	570	189	800	750	750	200
23.....	85	53	114	245	261	2,590	236	167	750	660	1,000	136
24.....	81	52	100	301	261	1,300	1,060	167	705	615	750	126
25.....	79	98	91	274	248	2,430	615	136	615	615	660	122
26.....	77	60	490	287	248	1,550	570	287	570	800	615	124
27.....	74	55	850	315	236	1,180	450	189	570	615	530	345
28.....	69	53	450	301	236	950	380	189	1,690	615	450	315
29.....	71	64	287	287	345	750	362	.....	1,120	570	450	285
30.....	70	60	236	345	315	660	845	.....	850	530	380	156
31.....	76	53	.....	1,060	.....	570	315	.....	750	.....	330	.....
Mean...	123	66	149	349	326	654	554	214	972	976	720	232

Monthly discharge of BEAVER KILL AT COOKS FALLS, for the year ended June 30,
1919

[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				Run-off Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	274	69	123	0.521	0.60
August.....	105	52	66	0.280	0.32
September.....	850	54	149	0.631	0.70
October.....	1,060	189	349	1.48	1.71
November.....	750	112	326	1.38	1.54
December.....	2,590	156	654	2.77	3.19
January.....	1,760	236	554	2.35	2.71
February.....	315	136	214	0.911	0.95
March.....	2,910	530	972	4.12	4.75
April.....	2,430	530	976	4.14	4.62
May.....	1,300	330	720	3.05	3.52
June.....	570	122	232	0.983	1.10
The year.....	2,910	52	445	1.89	25.71

WEST BRANCH, DELAWARE RIVER

A brief description of the West branch, Delaware river, will be found in the description of the Delaware river.

WEST BRANCH OF DELAWARE RIVER AT HALE EDDY

Location.—At the highway bridge in the village of Hale Eddy, Delaware county, 8 miles below the power dam of the Deposit Electric Co., and $8\frac{1}{2}$ miles above junction with the East branch of Delaware river.

Drainage area.—611 square miles. (Measured on post-route map.)

Records available.—November 15, 1912, to June 30, 1919. Records were obtained at Hancock, about 7 miles below, from October 15, 1902, to December 31, 1912.

Gage.—Vertical staff in four sections, attached to rocks near the right abutment of the bridge and to the abutment; read by W. J. Shanly.

Discharge measurements.—Made from the cable installed in July, 1916, about 400 feet below the gage. Previous measurements made from the highway bridge or by wading.

Channel and control.—Coarse gravel and boulders; practically permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 7.5 feet at 4 p. m., April 12; discharge, 5,420 second-feet. Minimum stage recorded, 1.5 feet several times in August; discharge, 65 second-feet.

1913–1919: Maximum stage recorded, *15.3 feet at 5 p. m., March 27, 1913; discharge, about 25,000 second-feet. Minimum stage recorded, 1.0 foot at 6 p. m., September 21, 1913; discharge, 34 second-feet.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Rating curve well defined between 300 and 18,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table.

* The observer states that on October 10, 1893, the water rose to elevation indicated by a nail in a tree near the gage. The nail is at gage height 20.3 feet. No data available indicating whether the present rating is applicable to this gage height.

Results good during periods when the stage-discharge relation is not affected by ice. Results good for other periods.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY,
during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 14.....	E. D. Burchard.....	1.62	94
Aug. 14.....	E. D. Burchard.....	1.61	92.5
Oct. 12.....	C. C. Covert.....	3.65	1,010
Dec. 24.....	C. C. Covert.....	4.44	1,550
1919			
Jan. 22 a.....	C. C. Covert.....	2.94	500
May 8.....	J. W. Moulton.....	3.57	855
June 27.....	C. C. Covert.....	2.14	230

a Some shore ice.

Daily gage height, in feet, of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY,
for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.55	1.88	1.68	3.7	5.4	2.7	3.9	3.15	6.2	4.2	3.6	2.75
2.....	2.9	1.85	1.80	3.45	4.8	2.6	6.0	3.05	5.2	4.0	3.6	2.65
3.....	3.1	1.75	2.15	3.9	4.8	2.75	5.6	2.95	4.6	4.0	3.6	2.55
4.....	2.75	1.75	2.15	3.7	4.6	2.8	5.0	3.05	4.3	4.8	3.6	2.5
5.....	2.65	1.72	1.95	3.8	4.2	2.65	4.5	3.2	4.2	4.8	3.6	2.4
6.....	2.6	1.62	2.2	7.1	3.8	2.5	4.2	3.05	4.4	5.0	3.6	2.35
7.....	2.65	1.60	2.25	6.2	3.8	2.6	3.9	2.85	4.2	5.1	3.45	2.25
8.....	2.6	1.52	2.1	5.0	3.6	2.65	3.5	2.7	4.0	4.8	3.5	2.3
9.....	2.45	1.60	2.05	4.6	3.6	2.85	3.35	2.65	4.9	4.8	3.45	2.25
10.....	2.35	1.70	1.90	4.4	3.5	2.85	3.2	2.55	6.0	5.0	4.6	2.2
11.....	2.45	1.95	1.95	4.0	3.45	2.65	3.1	2.35	5.4	5.0	6.1	1.95
12.....	2.55	1.75	1.88	3.7	3.35	3.0	3.05	2.35	4.8	7.4	5.8	1.75
13.....	2.55	1.70	1.92	3.8	3.2	2.85	3.05	2.55	4.5	6.6	6.0	1.75
14.....	2.7	1.60	1.85	3.6	2.95	3.4	3.3	2.95	4.2	6.0	5.6	1.70
15.....	2.85	1.65	1.88	3.45	2.8	4.4	3.5	4.0	4.0	5.4	5.0	2.05
16.....	2.8	1.80	1.75	3.15	2.8	4.5	3.25	3.6	4.0	5.0	4.6	2.05
17.....	2.65	1.85	1.80	3.05	2.75	4.0	3.3	3.0	4.6	5.6	4.6	2.2
18.....	2.7	1.80	2.1	3.0	4.0	3.9	3.25	2.85	5.3	5.0	4.6	2.35
19.....	2.7	1.75	2.2	2.85	3.9	3.8	3.15	2.75	5.0	4.8	4.1	2.15
20.....	2.6	1.72	2.3	2.85	3.8	3.6	3.15	2.65	4.8	4.4	3.8	2.15
21.....	2.55	1.70	3.2	2.8	3.6	3.6	3.05	2.8	4.6	4.2	3.8	2.25
22.....	2.45	1.72	3.3	2.8	3.6	3.6	2.9	2.65	4.4	4.0	3.7	2.05
23.....	2.4	1.62	3.2	2.95	3.45	4.9	2.95	2.7	4.2	3.8	4.1	1.75
24.....	2.3	1.52	3.4	2.9	3.3	4.4	4.8	2.65	4.0	3.8	3.9	1.75
25.....	2.2	1.52	4.0	2.9	3.2	5.3	4.4	2.65	3.8	3.8	3.8	1.75
26.....	2.15	1.55	5.2	2.9	3.15	5.0	4.2	3.05	3.8	3.8	3.7	2.0
27.....	1.95	1.58	5.4	3.0	3.05	4.8	4.0	2.9	3.8	3.8	3.45	2.1
28.....	1.68	1.58	5.1	2.95	2.9	4.5	3.8	2.95	3.8	3.8	3.35	2.1
29.....	1.65	1.65	4.9	2.95	2.9	4.2	3.7	.....	4.5	3.6	3.15	2.0
30.....	1.75	1.70	4.1	3.1	2.8	4.0	3.6	.....	4.6	3.6	3.05	1.95
31.....	2.2	1.65	.....	5.9	.....	3.8	3.3	.....	4.5	.....	2.95	.....

GAGING OF STREAMS: DELAWARE RIVER BASIN. 377

Daily discharge, in second-feet, of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	388	150	101	1,040	2,560	455	1,180	690	3,540	1,420	970	490
2.....	555	142	130	870	1,940	410	3,280	632	2,340	1,260	970	432
3.....	660	118	232	1,180	1,940	480	2,790	580	1,760	1,260	970	388
4.....	480	118	232	1,040	1,760	505	2,140	632	1,500	1,940	970	365
5.....	432	110	170	1,110	1,420	432	1,670	720	1,420	1,940	970	325
6.....	410	89	250	4,810	1,110	365	1,420	632	1,580	2,140	970	305
7.....	432	85	268	3,540	1,110	410	1,180	530	1,420	2,240	870	268
8.....	410	69	215	2,140	970	432	900	455	1,260	1,940	900	285
9.....	345	85	200	1,760	970	530	810	432	2,040	1,940	870	268
10.....	305	105	155	1,580	900	530	720	388	3,280	2,140	1,760	250
11.....	345	170	170	1,260	870	432	660	305	2,560	2,140	3,410	170
12.....	388	118	150	1,040	810	605	632	305	1,940	5,260	3,030	118
13.....	388	105	161	1,110	720	530	632	388	1,670	4,080	3,280	118
14.....	455	85	142	970	580	840	780	580	1,420	3,280	2,790	105
15.....	530	95	150	870	505	1,580	900	1,260	1,260	2,560	2,140	200
16.....	505	130	118	690	505	1,670	750	970	1,260	2,140	1,760	200
17.....	432	142	130	632	480	1,260	780	605	1,760	2,790	1,760	250
18.....	455	130	215	605	1,260	1,180	750	530	2,450	2,140	1,760	305
19.....	455	118	250	530	1,180	1,110	690	480	2,140	1,940	1,340	232
20.....	410	110	285	530	1,110	970	690	432	1,940	1,580	1,110	232
21.....	388	105	720	505	970	970	632	505	1,760	1,420	1,110	268
22.....	345	110	780	505	970	970	555	432	1,580	1,260	1,040	200
23.....	325	89	720	580	870	2,040	580	455	1,420	1,110	1,840	118
24.....	285	69	840	555	780	1,580	1,940	432	1,260	1,110	1,180	118
25.....	260	69	1,260	555	720	2,450	1,580	432	1,110	1,110	1,110	118
26.....	232	75	2,340	555	690	2,140	1,420	632	1,110	1,110	1,040	185
27.....	170	81	2,560	605	632	1,940	1,260	555	1,110	1,110	870	215
28.....	101	81	2,240	580	555	1,670	1,110	580	1,110	1,110	810	215
29.....	95	95	2,040	580	555	1,420	1,040	.....	1,670	970	690	185
30.....	118	105	1,340	660	505	1,260	970	.....	1,760	970	632	170
31.....	250	95	.....	3,150	.....	1,110	780	.....	1,670	.....	580	.....
Mean...	366	105	619	1,170	998	1,040	1,140	556	1,750	1,910	1,390	236

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY, for the year ended June 30, 1919
[Drainage area, 611 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	660	95	366	0.599	0.69
August.....	170	69	105	0.172	0.20
September.....	2,560	101	619	1.01	1.13
October.....	4,810	505	1,170	1.92	2.21
November.....	2,560	480	998	1.63	1.82
December.....	2,450	365	1,040	1.70	1.96
January.....	3,280	555	1,140	1.87	2.16
February.....	1,260	305	556	0.910	0.95
March.....	3,540	1,110	1,750	2.86	3.30
April.....	5,260	970	1,910	3.13	3.49
May.....	3,410	580	1,390	2.27	2.62
June.....	480	105	236	0.386	0.43
The year.....	5,260	69	940	1.54	20.96

SUSQUEHANNA RIVER DRAINAGE BASIN

DESCRIPTION

Susquehanna river rises in Otsego lake, in northern Otsego county, at an elevation of 1,193 feet above tide, and flows in a general southerly direction into Chesapeake bay. Its course is in many places extremely tortuous, crossing the State boundary between New York and Pennsylvania three times. The entire length of the river is about 500 miles and it drains an area of 27,400 square miles, of which 21,060 square miles lie in Pennsylvania, 6,080 in New York and 260 in Maryland.

Three important streams contribute to the flow in New York state — Unadilla, Chenango and Chemung rivers. These streams all enter from the north. Unadilla, the smallest, joins the main stream near Sidney, Chenango at Binghamton and Chemung at a point in Pennsylvania about 8 miles below the state line.

The topography of the basin varies widely in character. In New York the stream and its tributaries flow through a rolling and, in places, rather broken country, bounded on the north by a mountainous area. In this part of its course its bed is of gravel or sand, with rock ledges here and there, and its banks are moderately high and not extensively subject to overflow. In Pennsylvania the river enters a mountain region, its banks are high and it winds and twists among the parallel ranges in a bed composed generally of drift materials, gravels, sand and boulders. In the lower part of its course, from Marietta, Pa., to Havre de Grace, Md., it occupies a broad, deep valley, ranging in width from a few hundred feet to more than a mile, and is for the most part bounded on either shore by rocky bluffs and table-lands elevated from 100 to 500 feet above its waters.

SUSQUEHANNA RIVER

SUSQUEHANNA RIVER AT CONKLIN

Location.—At steel highway bridge, just below Conklin, Broome county, 5 miles below Big Snake creek and 8 miles above Chenango river.

Drainage area.—2,350 square miles.

Records available.—November 13, 1912, to June 30, 1919. Records were obtained at Binghamton, 8 miles below, from July 31, 1901, to December 31, 1912.

Gage.—Gurley 7-day water-stage recorder on left bank, just below the highway bridge. Prior to January 21, 1919, a Stevens water-stage recorder operated here. Stevens gage removed because of necessary repairs.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel and boulders; probably permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 10.65 feet at 3 p. m., October 31; discharge, 17,900 second-feet. Minimum stage, from water-stage recorder, 2.43 feet from 1 to 2 a. m., August 9; discharge, 488 second-feet.

1912-1919: Maximum stage recorded, 19.74 feet at the former station in Binghamton at 7:40 a. m., March 2, 1902; discharge, about 62,500 second-feet. Minimum stage recorded, 1.32 feet at 8:20 a. m. and 4 p. m., September 16, 1913; discharge, 106 second-feet.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Usually affected by ice for a large portion of the period from January to March, inclusive. Rating curve well defined between 250 and 55,000 second-feet. Operation of the water-stage recorder fairly satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, except for days when the mean gage height would not give the discharge within 1 per cent; for such days the discharge is the mean of 24 hourly determinations. Gage heights obtained by inspecting gage-height graph or by taking mean of two observations per day. Records good except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of SUSQUEHANNA RIVER AT CONKLIN, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918 Aug. 16.....	E. D. Burchard.....	Feet 2.73	Sec.-ft. 672
1919 Jan. 21.....	E. D. Burchard.....	4.32	2,390
May 7.....	J. W. Moulton.....	5.30	3,900

Daily gage height, in feet, of SUSQUEHANNA RIVER AT CONKLIN, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.7	2.67	a	4.6	9.4	3.85	5.1	4.4	a	5.6	5.05	3.9
2.....	4.05	2.56	a	4.55	a	3.85	6.4	4.3	7.5	5.3	5.0	3.75
3.....	4.4	2.54	3.5	4.9	6.4	3.95	8.0	4.3	6.7	5.25	5.0	3.6
4.....	3.95	2.49	3.11	4.85	5.95	a	7.2	4.25	5.8	5.9	5.05	3.5
5.....	3.8	2.47	2.85	4.55	5.75	a	6.2	4.2	5.6	6.6	4.8	3.39
6.....	3.65	2.50	2.99	a	5.6	a	5.6	4.15	6.0	6.8	5.35	3.33
7.....	3.48	2.47	2.92	7.7	5.3	a	5.2	4.1	5.8	6.7	5.3	3.25
8.....	3.35	2.46	2.74	a	5.05	a	5.4	3.85	5.3	6.7	5.2	3.12
9.....	3.25	2.43	2.76	5.45	4.85	a	5.3	3.65	a	6.9	5.3	3.10
10.....	3.20	2.45	2.66	5.0	4.75	a	5.0	3.7	7.3	6.8	a	3.09
11.....	3.45	2.50	2.60	4.7	4.6	a	4.5	3.6	7.6	7.0	8.5	3.09
12.....	3.95	2.50	2.52	4.5	4.55	a	4.9	3.6	6.7	8.6	8.7	3.17
13.....	4.3	2.65	a	4.35	4.4	a	4.9	3.45	6.05	8.8	8.6	3.01
14.....	4.0	2.78	2.79	4.25	4.3	a	4.7	3.65	5.75	7.8	7.9	2.95
15.....	3.85	2.84	2.70	4.15	4.2	a	5.0	a	5.25	7.1	7.0	2.95
16.....	3.95	2.73	2.71	4.05	4.1	a	5.4	5.1	5.5	6.8	6.4	3.05
17.....	3.75	2.69	2.76	3.9	4.0	a	4.9	a	a	7.0	6.1	a
18.....	3.6	2.54	2.91	3.8	a	a	4.9	4.15	7.6	7.0	6.1	3.5
19.....	3.85	2.50	3.03	3.7	6.7	a	4.6	4.1	7.4	6.5	6.0	3.21
20.....	3.7	2.50	a	3.6	6.2	a	4.9	3.95	6.7	6.0	5.5	3.07
21.....	3.42	2.50	4.45	3.8	5.6	a	4.7	3.8	6.2	5.7	a	3.20
22.....	3.35	2.50	4.35	4.0	5.25	a	4.35	3.6	6.1	5.45	a	a
23.....	3.20	2.50	4.0	3.9	5.0	6.05	4.35	3.55	5.85	5.2	a	3.5
24.....	3.14	2.50	3.7	3.7	4.8	6.0	a	3.6	5.5	5.0	a	3.15
25.....	3.13	2.50	3.55	3.6	4.6	a	6.2	3.7	5.3	5.15	5.45	2.96
26.....	3.00	2.50	a	3.55	4.45	a	5.65	4.05	5.1	5.3	5.3	2.82
27.....	2.89	2.50	6.7	3.5	4.35	a	5.25	4.2	5.0	5.15	5.0	2.77
28.....	2.78	2.50	6.4	3.65	4.2	a	5.05	4.0	5.9	5.1	4.65	a
29.....	2.68	2.50	5.6	3.6	4.2	5.6	4.85	.....	6.3	5.15	4.35	a
30.....	2.69	2.50	4.85	a	4.2	5.1	4.7	.....	5.55	5.2	4.15	a
31.....	2.69	2.50	.....	a	.....	5.0	4.6	.....	5.55	.....	4.0	.....

a No record.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 381

Daily discharge, in second-feet, of SUSQUEHANNA RIVER AT CONKLIN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,570	607	800	2,830	14,000	1,750	3,680	2,510	4,860	4,640	3,590	1,810
2.....	2,000	572	1,800	2,750	9,360	1,750	6,400	2,360	9,000	4,040	3,500	1,630
3.....	2,510	558	1,350	3,330	6,400	1,880	10,200	2,360	7,100	3,950	3,500	1,460
4.....	1,880	524	979	3,240	5,380	1,900	8,280	2,280	5,060	5,280	3,590	1,350
5.....	1,690	512	775	2,750	4,950	2,200	5,940	2,210	4,640	6,860	3,160	1,240
6.....	1,520	530	882	8,380	4,640	2,200	4,640	2,140	5,500	7,330	4,140	1,180
7.....	1,330	512	826	9,500	4,040	2,200	3,860	2,070	5,060	7,100	4,040	1,100
8.....	1,200	506	698	5,980	3,590	2,200	4,230	1,750	4,040	7,100	3,860	988
9.....	1,100	488	712	4,330	3,240	2,200	4,040	1,520	5,050	7,560	4,040	970
10.....	1,150	500	642	3,500	3,080	2,400	3,500	1,570	8,520	7,330	6,790	962
11.....	1,300	530	600	2,990	2,830	2,800	2,670	1,460	9,240	7,800	11,500	962
12.....	1,880	530	544	2,670	2,750	4,000	3,330	1,460	7,100	11,800	12,100	968
13.....	2,360	635	680	2,440	2,510	5,500	3,330	1,300	5,600	12,300	11,800	898
14.....	1,940	728	733	2,280	2,360	7,000	2,990	1,400	4,950	9,740	10,000	850
15.....	1,750	768	670	2,140	2,210	8,000	3,500	2,060	3,950	8,040	7,800	850
16.....	1,880	691	677	2,000	2,070	7,000	4,230	3,680	4,430	7,330	6,400	930
17.....	1,630	663	712	1,810	1,940	6,000	3,330	2,990	6,730	7,800	5,720	1,040
18.....	1,460	558	818	1,660	5,340	5,000	3,330	2,140	9,240	7,800	5,720	1,350
19.....	1,750	530	914	1,570	7,100	4,000	2,830	2,070	8,760	6,630	5,500	1,070
20.....	1,570	530	1,300	1,460	5,940	3,400	3,330	1,880	7,100	5,500	4,430	946
21.....	1,270	530	2,590	1,690	4,640	3,400	2,990	1,690	5,940	4,840	3,800	1,060
22.....	1,200	530	2,440	1,940	3,950	6,000	2,440	1,460	5,720	4,330	4,000	1,160
23.....	1,060	530	1,940	1,810	3,500	5,800	2,440	1,400	5,170	3,860	5,000	1,350
24.....	1,010	530	1,570	1,570	3,160	8,500	4,500	1,460	4,430	3,500	5,900	1,020
25.....	997	530	1,400	1,460	2,830	6,000	5,940	1,570	4,040	3,770	4,330	858
26.....	890	530	3,930	1,400	2,590	6,000	4,740	2,000	3,680	4,040	4,040	754
27.....	803	530	7,100	1,350	2,440	5,500	3,950	2,210	3,500	3,770	3,500	719
28.....	728	530	6,400	1,520	2,210	5,000	3,590	1,940	5,280	3,680	2,910	750
29.....	658	530	4,640	1,450	2,210	4,640	3,240	.....	6,170	2,770	2,440	800
30.....	663	530	3,240	2,170	2,210	3,680	2,990	.....	4,530	3,960	2,140	750
31.....	663	530	.....	15,100	.....	3,500	2,830	.....	4,530	.....	1,940	.....
Mean...	1,400	558	1,750	3,200	4,120	4,140	4,110	1,960	5,760	6,180	5,200	1,060

NOTE.— Discharge estimated, December 4 to 22 and 25 to 28, May 21 to 24 and June 28 to 30. Hydrograph on gage-height record intermittent and breaks estimated, November 12 to 16 and 24 to 27. Chain gage observations made once daily, used December 29 to January 21, inclusive. Stage-discharge relation not affected by ice.

Monthly discharge of SUSQUEHANNA RIVER AT CONKLIN, for the year ended June 30, 1919

[Drainage area, 2,350 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	
July.....	2,510	656	1,400	0.596	0.69
August.....	768	488	558	0.238	0.27
September.....	7,100	544	1,750	0.744	0.83
October.....	15,100	1,350	3,200	1.36	1.57
November.....	14,000	1,940	4,120	1.75	1.95
December.....	8,000	1,750	4,140	1.78	2.03
January.....	10,200	2,440	4,110	1.75	2.02
February.....	3,680	1,800	1,960	0.834	0.87
March.....	9,240	3,500	5,760	2.45	2.82
April.....	12,300	3,500	6,180	2.63	2.93
May.....	12,100	1,940	5,200	2.21	2.55
June.....	1,810	719	1,060	0.451	0.50
The year.....	15,100	488	3,286	1.40	19.08

CHENANGO RIVER

CHENANGO RIVER NEAR CHENANGO FORKS

Location.—About $1\frac{1}{2}$ miles below Tioughnioga river, 2 miles by road below Chenango Forks post-office, Broome county, and $11\frac{1}{2}$ miles above Binghamton and the mouth.

Drainage area.—1,420* square miles. See "Diversions."

Records available.—November 11, 1912, to June 30, 1919. Records were obtained at Binghamton, July 31, 1901, to December 31, 1911.

Gage.—Stevens water-stage recorder on the left bank on the farm of Erastus Ingraham.

Discharge measurements.—Made from cable about 100 feet above the gage by wading.

Channel and control.—Sand, gravel and small cobblestones; practically permanent.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 8.1 feet at 7:50 A. M., October 31; discharge, 11,800 second-feet. Minimum stage, from water-stage recorder, 2.4 feet at 4 P. M., August 4, and 7 A. M., August 5; discharge, 170 second-feet.

1901-1919: Maximum stage recorded, 12.18 feet from noon until 1 P. M., April 2, 1916; discharge, 27,900 second-feet. Minimum discharge recorded occurred at gage height 4.6 feet at the former station in Binghamton at 8 A. M., August 28, 1909; discharge, about 10 second-feet.

Ice.—Stage-discharge relation affected by ice.

Diversions.—The run-off from 87.3 square miles at head of Chenango river and from 15.7 square miles at head of Tioughnioga river is stored in reservoirs and except for discharge over the spillways it is diverted out of the drainage area into the Erie canal. The above-mentioned drainage area for Chenango river does not include these two areas.

Accuracy.—Stage-discharge relation practically permanent; usually affected by ice for a large part of the period from January to March, inclusive. Rating curve well defined between 120 and 35,000 second-feet. Operation of the water-stage recorder fairly satisfactory throughout the year. Daily discharge ascertained by

* Revised area as computed by engineers of the State Conservation Commission. Formerly given as 1,380 square miles.

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applying to the rating table mean daily gage heights, determined by inspecting gage height graph or for days of considerable fluctuation by averaging the hourly discharge. Results good except for periods when stage-discharge was affected by ice, when results were fairly good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of CHENANGO RIVER NEAR CHENANGO FORKS, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 18.....	E. D. Burchard.....	3.01	559
1919			
Jan. 21.....	C. C. Covert.....	3.63	1,400
May 7.....	J. W. Moulton.....	4.35	2,370
May 12.....	J. W. Moulton.....	6.69	7,730
June 30.....	C. C. Covert.....	2.82	381

Daily gage height, in feet, of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	4.8	2.93	2.73	3.68	7.4	3.50	b	3.64	b	4.65	4.5	3.69
2.....	4.05	2.83	2.76	3.75	6.6	3.42	b	3.57	b	4.55	4.7	3.59
3.....	b	2.71	2.76	3.92	4.9	3.45	5.8	3.63	5.05	4.6	4.55	3.49
4.....	b	2.55	2.76	3.82	4.5	3.54	5.15	3.59	4.75	5.35	4.3	3.42
5.....	b	2.58	2.76	4.2	4.2	3.60	4.7	3.58	4.95	5.7	4.7	3.34
6.....	b	2.81	2.76	4.5	4.1	3.60	4.5	3.54	5.1	5.75	4.65	3.29
7.....	b	2.81	2.76	4.8	3.98	3.60	4.5	3.39	4.55	5.6	4.5	3.33
8.....	3.20	2.87	2.76	4.7	3.88	3.65	4.45	3.36	4.35	5.55	4.75	3.28
9.....	3.15	2.73	2.76	4.4	3.80	3.70	4.45	3.29	b	5.8	4.66	3.20
10.....	3.20	2.92	2.76	4.0	3.80	3.80	4.1	3.34	b	5.85	b	3.19
11.....	b	3.00	2.76	3.85	3.80	3.90	4.1	3.25	6.1	6.35	7.5	3.17
12.....	b	2.92	2.76	3.35	3.65	4.1	4.0	3.30	5.25	7.4	6.7	3.12
13.....	4.05	2.92	2.83	3.38	3.40	5.1	3.87	3.24	4.95	6.9	6.6	3.07
14.....	3.82	3.30	3.02	3.22	3.40	5.9	3.88	b	4.6	6.2	5.8	3.03
15.....	3.83	3.11	3.19	3.22	3.55	6.6	3.87	5.0	4.3	5.6	5.25	3.00
16.....	b	2.86	3.22	3.20	3.55	6.1	3.83	4.45	b	5.3	5.0	2.96
17.....	b	2.86	3.19	3.20	4.25	5.6	3.72	3.90	6.0	5.5	5.05	3.10
18.....	b	2.86	3.32	3.18	6.9	5.1	3.76	3.78	6.2	5.4	5.6	3.15
19.....	b	2.86	3.40	3.18	6.3	4.3	3.77	3.57	5.85	5.1	4.95	3.01
20.....	b	2.86	4.0	3.18	5.6	4.1	3.71	3.50	5.2	4.8	4.6	3.01
21.....	b	2.83	4.5	3.24	4.95	4.05	3.66	3.44	5.0	4.75	4.45	3.02
22.....	b	2.76	3.88	3.60	4.5	b	3.66	3.39	4.8	4.55	4.45	3.00
23.....	3.02	2.71	3.95	3.40	4.3	5.6	3.78	3.40	4.5	4.3	.....	2.93
24.....	3.22	2.71	4.25	3.20	4.15	5.15	b	3.41	4.35	4.3	5.65	2.88
25.....	3.32	2.71	4.8	3.35	3.94	b	b	3.42	4.2	4.65	5.55	2.85
26.....	3.15	2.71	5.2	3.48	3.85	5.75	4.45	3.68	4.05	4.5	5.15	2.84
27.....	3.00	2.71	5.25	3.42	3.80	5.05	4.25	3.52	b	4.5	4.7	2.83
28.....	2.76	2.71	4.5	3.20	3.70	4.75	4.2	b	b	4.75	4.4	2.89
29.....	3.07	2.71	3.92	3.32	3.58	4.45	3.98	.....	5.2	4.9	4.15	2.88
30.....	2.94	2.71	3.70	3.72	3.52	4.45	3.90	.....	4.85	4.75	3.95	2.82
31.....	2.94	2.71	.....	8.0	.....	4.3	3.79	.....	4.9	.....	3.80	.....

b See note under next table.

Daily discharge, in second-feet, of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3,160	496	338	1,320	9,700	1,090	2,650	1,270	6,480	2,880	2,610	1,340
2.....	1,860	414	360	1,420	7,370	994	6,830	1,180	5,860	2,700	2,970	1,210
3.....	1,600	322	360	1,660	3,350	1,030	5,310	1,260	3,660	2,790	2,700	1,080
4.....	1,400	232	360	1,520	2,610	1,140	3,860	1,210	3,060	4,280	2,270	964
5.....	1,200	246	360	2,100	2,100	1,220	2,970	1,190	3,450	5,070	2,970	904
6.....	950	398	360	2,610	1,940	1,220	2,610	1,140	3,750	5,190	2,880	849
7.....	850	398	360	3,160	1,750	1,220	2,610	959	2,700	4,840	2,610	893
8.....	750	446	360	2,970	1,600	1,280	2,520	926	2,360	3,720	3,060	838
9.....	700	338	360	2,440	1,490	1,350	2,520	849	4,600	5,310	2,880	750
10.....	750	487	360	1,780	1,490	1,490	1,940	904	9,340	5,430	6,690	740
11.....	2,000	555	860	1,560	1,490	1,680	1,940	805	6,050	6,700	10,000	720
12.....	2,930	487	360	915	1,280	1,940	1,780	860	4,060	9,700	7,650	670
13.....	1,860	487	414	945	970	3,750	1,560	794	3,450	8,210	7,870	622
14.....	1,520	860	574	772	970	5,550	1,600	1,270	2,790	6,810	5,310	584
15.....	1,530	660	740	772	1,160	7,370	1,590	3,550	2,270	4,840	4,060	555
16.....	1,300	438	772	750	1,160	6,050	1,530	2,530	2,670	4,170	3,550	821
17.....	1,200	438	740	750	2,180	4,840	1,380	1,360	5,800	4,610	3,650	650
18.....	1,400	438	882	730	8,210	3,750	1,430	1,460	6,310	4,390	4,840	700
19.....	1,100	438	970	730	6,570	2,270	1,450	1,180	5,430	3,750	3,450	564
20.....	900	438	1,780	730	4,840	1,940	1,360	1,090	3,960	3,160	2,790	564
21.....	750	414	2,610	794	3,450	1,860	1,300	1,020	3,550	3,060	2,520	574
22.....	65	360	1,600	1,220	2,610	2,240	1,300	959	3,160	2,700	2,520	555
23.....	570	322	1,700	970	2,270	4,840	1,460	970	2,610	2,270	4,260	496
24.....	774	322	2,180	750	2,020	3,860	4,160	982	2,360	2,860	4,960	454
25.....	582	322	3,160	915	1,690	5,180	3,220	994	2,100	2,880	4,720	430
26.....	700	322	3,960	1,070	1,560	5,190	2,520	1,320	1,860	2,610	3,860	422
27.....	555	322	4,060	994	1,490	8,660	2,180	1,120	2,000	2,610	2,970	414
28.....	360	322	2,610	750	1,350	3,060	2,100	1,090	6,190	3,060	2,440	462
29.....	622	322	1,690	882	1,190	2,520	1,750	.....	3,960	3,350	2,020	454
30.....	504	322	1,350	1,380	1,120	2,520	1,630	.....	3,260	3,060	1,700	406
31.....	504	322	.....	11,500	.....	2,270	1,480	.....	3,350	.....	1,490	.....
Mean...	1,160	409	1,200	1,640	2,700	2,850	2,340	1,230	3,950	4,230	3,800	680

NOTE.— Discharge, July 23 to September 30, determined from semidaily observations on the staff gage. Discharge, July 3 to 7 and 16 to 22, estimated by comparison of gage-height graph with that for the Susquehanna river at Conklin. Stage-discharge relation not affected by ice.

Monthly discharge of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended June 30, 1919

[Drainage area, 1,420 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	3,160	360	1,160	0.841	0.97
August.....	860	232	409	0.296	0.34
September.....	4,060	338	1,200	0.870	0.97
October.....	11,500	730	1,640	1.16	1.34
November.....	9,700	970	2,700	1.90	2.12
December.....	7,370	994	2,850	2.01	2.32
January.....	6,830	1,300	2,340	1.65	1.90
February.....	3,550	794	1,230	0.866	0.90
March.....	9,340	1,860	3,950	2.78	3.20
April.....	9,700	2,270	4,230	2.98	3.32
May.....	10,000	1,490	3,800	2.68	3.09
June.....	1,340	406	680	0.479	0.53
The year.....	11,500	232	2,182	1.53	21.00

CHEMUNG RIVER

DESCRIPTION

Chemung river is formed at Painted Post by the confluence of Tioga and Cohocton rivers. Cohocton river lies entirely in the state of New York. Tioga river receives, just above its mouth, Canisteo river, a large tributary, which also has its drainage basin in New York to the south of Cohocton. The drainage area of Tioga river, above the Canisteo, is mainly in Pennsylvania. Chemung river flows southeastward through Corning, Elmira and Chemung, crosses the state line and flows for a short distance in Pennsylvania, then returns to New York and crosses again to Pennsylvania near Waverly, finally emptying into the Susquehanna near Athens, Bradford county, Pa. The total length of the river is about 40 miles, of which 30 miles lie in New York. The drainage area, measured at the mouth, is 2,520 square miles.

The topographic features of the basin are, as a rule, bold and broad. The hills rise to a height of several hundred feet on either side, within a short distance of the stream. The upland plateau is to a large extent wooded, has impervious soil, no lake storage and few marsh areas. Tributaries are ramifying and uniformly distributed, though not very numerous, and dry gullies, or flood channels, are common. The main river is sluggish, with low banks and a broad valley, or flood plain, which is often overflowed. The concentration of storm waters from the three large streams, which unite just above Corning, makes possible excessive floods. Dikes have been erected in the cities of Elmira and Corning for protection. One of the highest recorded freshets in the stream occurred June 1, 1889. It was preceded by phenomenal rainfall, aggregating several inches in a few hours during the night of May 31. The discharge at this time has been estimated at 67 second-feet per square mile from 2,055 square miles, or 138,000 second-feet.^a

^a Report of Francis Collingwood, C. E., on "The Protection of the City of Elmira against Floods."

CHEMUNG RIVER AT CHEMUNG

Location.— At the new highway bridge, about midway between Chemung, Chemung county, N. Y., and Willawana, Pa., half a mile upstream from the state line and about 10 miles above the mouth of the river.

Drainage area.— 2,440 square miles.

Records available.— September 11, 1903, to June 30, 1919.

Gage.— Tape gage at the upstream side of the right span of the bridge. Gage read by D. L. Orcutt.

Discharge measurements.— Made from the bridge at medium and high stages and by wading at low stages.

Channel and control.— Sand and gravel; occasionally shifting.

Extremes of discharge.— Current year: Maximum stage recorded, 16.72 feet at 6:38 A. M., May 23; discharge, about 57,900 second-feet. Minimum stage recorded, 1.64 feet at 7:30 A. M., August 30; discharge, 170 second-feet.

1903-1919: Maximum stage recorded, 17.96 feet at 7 A. M., March 15, 1918; discharge, about 67,000 second-feet. Minimum stage recorded, 1.47 feet at 7 A. M., August 14, 1911; discharge, about 49 second-feet.

Ice.— Stage-discharge relation affected by ice.

Regulation.— Power is developed above the station, the largest plant being at Elmira.

Accuracy.— Stage-discharge relation probably permanent between dates of shift; affected by ice for a large portion of the period from December to March, inclusive. Rating curve well defined between 200 and 45,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good except during periods when the stage-discharge relation was affected by ice. Results fair for those periods.

Coöperation.— Station established and maintained by United States Geological Survey in coöperation with the State Engineer and Surveyor.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 387

Discharge measurements of CHEMUNG RIVER AT CHEMUNG, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 19.....	E. D. Burchard.....	2.03	336
1919			
Jan. 22.....	E. D. Burchard.....	3.17	1,270
May 6.....	J. W. Moulton.....	3.76	1,910
June 29.....	C. C. Covert.....	3.34	1,380

Daily gage height, in feet, of CHEMUNG RIVER AT CHEMUNG, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.5	1.98	1.70	2.9	5.0	2.9	3.2	2.7	3.45	4.7	3.9	4.2
2.....	2.43	1.95	1.76	2.8	4.1	2.7	4.3	2.6	5.1	4.3	4.1	3.9
3.....	2.37	1.90	1.80	3.1	3.8	2.8	4.9	2.6	4.0	4.2	4.0	3.7
4.....	2.34	1.89	1.84	3.8	3.6	2.75	4.0	2.8	3.8	4.4	3.7	3.6
5.....	2.30	2.06	1.78	3.3	3.45	2.7	3.5	2.65	3.8	5.1	3.7	3.45
6.....	2.27	1.96	1.78	4.7	3.6	2.7	3.7	2.55	4.5	5.0	3.8	3.3
7.....	2.24	2.24	1.80	6.5	3.35	2.6	4.1	2.39	4.2	4.7	3.6	3.8
8.....	2.16	2.08	2.05	6.0	3.2	2.65	4.0	2.5	3.9	5.6	3.7	4.1
9.....	2.12	2.02	1.96	5.3	3.1	2.85	4.0	2.30	4.6	6.7	3.8	3.7
10.....	2.12	1.98	1.92	5.0	3.0	3.6	3.7	2.40	7.7	6.2	3.1	4.4
11.....	2.12	2.14	1.80	4.8	2.95	3.25	3.5	2.25	5.7	7.8	11.8	3.9
12.....	2.17	2.5	1.78	3.35	2.9	3.15	3.8	2.31	5.1	8.6	11.0	3.5
13.....	2.22	2.36	1.85	3.05	2.85	3.2	3.8	2.29	4.6	7.1	8.9	3.35
14.....	2.14	2.16	1.90	3.05	2.75	3.6	3.45	2.47	4.2	6.2	7.0	3.1
15.....	2.06	2.09	2.35	2.95	2.7	4.9	3.45	3.25	3.7	5.5	6.1	3.0
16.....	2.06	1.99	2.13	3.0	2.65	5.1	3.4	3.5	3.8	5.7	5.6	2.95
17.....	2.04	1.96	3.21	2.85	2.6	4.4	3.4	3.05	5.7	6.9	5.6	3.2
18.....	2.00	1.92	2.8	2.6	4.6	4.0	3.3	2.95	6.7	5.9	6.8	3.2
19.....	1.98	1.86	3.15	2.55	6.1	3.7	3.4	2.65	6.5	5.3	5.3	2.95
20.....	1.98	1.79	3.4	2.5	5.2	3.45	3.2	2.7	5.3	4.9	5.9	2.8
21.....	1.96	1.77	5.8	2.5	4.9	3.35	3.2	2.8	4.9	4.7	10.0	2.9
22.....	1.95	1.74	4.2	2.48	4.2	3.35	3.15	2.7	4.7	4.6	14.8	3.6
23.....	1.92	1.74	3.6	2.5	4.0	3.8	3.2	2.65	4.5	4.2	16.1	3.05
24.....	1.92	1.74	3.25	2.43	3.7	4.1	3.3	2.7	4.1	4.0	12.6	2.8
25.....	1.92	1.71	3.0	2.38	3.45	3.9	3.9	2.7	3.9	4.2	11.1	2.7
26.....	2.21	1.70	3.3	2.42	3.3	4.1	3.6	2.8	3.7	4.0	8.5	2.6
27.....	2.19	1.66	3.9	2.38	3.1	3.8	3.45	2.85	3.6	4.0	7.0	2.7
28.....	2.06	1.67	3.5	2.42	3.0	3.5	3.2	2.75	b	4.0	6.1	4.2
29.....	1.98	1.69	3.25	2.46	2.95	3.35	3.15	.....	5.0	4.1	5.4	3.45
30.....	1.96	1.66	2.95	2.5	2.95	3.2	3.1	.....	4.7	4.1	4.8	3.05
31.....	1.94	1.68	.....	3.7	.....	3.05	2.8	.....	5.1	.....	4.5	.....

b See note under next table.

**Daily discharge, in second-feet, of CHEMUNG RIVER AT CHEMUNG, for the year ended
June 30, 1919**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	630	299	168	980	4,040	960	1,250	790	1,540	3,460	2,140	2,600
2.....	581	282	192	870	2,440	790	2,760	710	4,240	2,760	2,440	2,140
3.....	539	255	208	1,150	2,000	870	3,840	710	2,290	2,600	2,290	1,860
4.....	513	250	227	2,000	1,730	830	2,290	870	2,000	2,930	1,860	1,730
5.....	490	343	200	1,360	1,540	790	1,600	750	2,000	4,240	1,860	1,510
6.....	470	288	200	3,460	1,730	790	1,860	670	3,100	4,040	2,000	1,330
7.....	451	451	208	7,560	1,420	710	2,440	553	2,600	3,460	1,730	2,030
8.....	401	354	338	6,240	1,250	750	2,290	630	2,140	5,300	1,860	2,430
9.....	377	321	288	4,650	1,150	915	2,290	490	3,280	8,140	2,000	1,830
10.....	377	299	266	4,040	1,050	1,730	1,860	560	11,400	6,750	12,800	2,930
11.....	377	389	208	3,650	1,000	1,300	1,600	458	5,530	11,700	28,000	2,110
12.....	407	630	200	1,420	960	1,200	2,000	497	4,240	14,600	20,030	1,600
13.....	438	532	232	1,100	915	1,250	2,000	484	3,280	9,380	15,700	1,400
14.....	389	401	255	1,100	830	1,730	1,540	609	2,600	6,750	9,060	1,150
15.....	343	360	525	1,000	790	3,840	1,540	1,300	1,860	5,080	6,460	1,030
16.....	343	302	383	1,050	750	4,240	1,480	1,600	2,000	5,530	5,300	1,030
17.....	332	288	432	915	710	2,930	1,480	1,100	5,530	8,750	5,300	1,200
18.....	310	266	870	710	3,280	2,290	1,360	1,000	8,140	6,000	8,440	1,230
19.....	299	236	1,200	670	6,490	1,860	1,480	750	7,560	4,650	4,650	1,000
20.....	299	204	1,480	630	4,440	1,540	1,250	790	4,650	3,840	6,000	870
21.....	288	196	5,760	630	3,840	1,420	1,250	870	3,840	3,460	20,000	960
22.....	282	184	2,600	616	2,600	1,420	1,200	790	3,460	3,280	14,800	1,730
23.....	266	184	1,730	630	2,290	2,000	1,250	750	3,100	2,600	53,500	1,100
24.....	266	184	1,300	581	1,860	2,440	1,360	790	2,440	2,290	32,000	870
25.....	266	172	1,050	546	1,540	2,140	2,140	790	2,140	2,600	24,800	790
26.....	432	168	1,360	574	1,360	2,440	1,730	870	1,860	2,290	14,200	710
27.....	419	154	2,140	546	1,150	2,000	1,540	915	1,730	2,290	9,060	790
28.....	343	157	1,000	574	1,050	1,600	1,250	830	5,500	2,290	6,490	2,600
29.....	299	164	1,300	602	1,000	1,420	1,200	.....	4,010	2,440	4,860	1,510
30.....	288	154	1,000	630	1,000	1,250	1,150	.....	3,460	2,140	3,650	1,100
31.....	277	161	.....	1,860	.....	1,100	870	.....	4,240	.....	3,100	.....
Mean...	380	278	931	1,660	1,870	1,630	1,710	783	3,730	4,860	11,500	1,510

NOTE.—Discharge estimated, March 28, by comparing with hydrographs of Susquehanna river at Conklin and Chenango river at Chenango Forks. Stage-discharge relation not affected by ice.

**Monthly discharge of CHEMUNG RIVER AT CHEMUNG, for the year ended June 30,
1919**

[Drainage area, 2,440 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	630	266	380	0.156	0.18
August.....	630	154	278	0.114	0.13
September.....	5,760	168	931	0.382	0.43
October.....	7,560	546	1,690	0.693	0.80
November.....	6,490	710	1,870	0.766	0.85
December.....	4,240	710	1,630	0.668	0.77
January.....	3,840	870	1,710	0.701	0.81
February.....	1,600	458	783	0.321	0.33
March.....	11,400	1,540	3,730	1.63	1.76
April.....	14,600	2,290	4,860	1.99	2.22
May.....	53,500	1,730	11,500	4.71	5.43
June.....	2,930	710	1,510	0.619	0.69
The year.....	53,500	154	2,573	1.05	14.40

TIOGA RIVER

TIOGA RIVER NEAR ERWINS

Location.—At highway bridge $\frac{1}{4}$ mile below the mouth of the Canisteo river, near the village of Erwins, Steuben county, and about 3 miles above the junction of the Tioga and Cohocton rivers to form the Chemung river at the town of Painted Post.

Drainage area.—1,320 square miles. (Furnished by Mr. Robert O. Hayt.)

Records available.—July 12, 1918, to June 30, 1919.

Gage.—Chain near left abutment, downstream side of bridge; graduated and read to quarter-tenths twice daily by Miss Jane Sexton.

Discharge measurements.—Made from bridge and at low stages by wading near the control one hundred yards downstream.

Channel and control.—Well compacted gravel; probably permanent.

Extremes of discharge.—Current year: Maximum stage recorded, 16.4 feet at 4 p. m., May 22, 1919; beyond the limits of present rating curve. Minimum stage recorded, 0.92 foot, August 30, 1918; discharge, 54 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—There is no considerable storage to interfere with the seasonal flow.

Accuracy.—Stage-discharge relation believed to be fairly permanent; probably affected by ice from December to March. Rating curve well defined below a discharge of 12,000 second-feet.

Coöperation.—Station established by the Lamoka Power Company under the direction of the United States Geological Survey. Maintained by the Survey in coöperation with the Power Co. and the State of New York.

Discharge measurements of TIOGA RIVER NEAR ERWINS, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 17.....	E. D. Burchard.....	1.15	125
July 17.....	E. D. Burchard.....	1.15	124
Aug. 17.....	C. C. Covert.....	1.28	143
Nov. 21.....	E. D. Burchard.....	3.38	1,770
Nov. 21.....	E. D. Burchard.....	3.36	1,710
1919			
Jan. 27.....	E. D. Burchard.....	2.27	798
Mar. 6.....	E. D. Burchard.....	3.97	2,680
April 4.....	J. W. Moulton.....	3.43	1,920
April 13.....	M. H. Carson.....	4.97	4,300
April 15.....	M. H. Carson.....	3.74	2,170
April 21.....	M. H. Carson.....	3.47	1,900
May 12.....	J. W. Moulton.....	8.38	12,000
May 26.....	O. W. Hartwell.....	5.84	5,800

Daily gage height, in feet, of TIOGA RIVER NEAR ERWINS, for the year ended June
30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.22	a	1.96	3.4	2.05	2.15	1.70	4.2	3.2	2.45	2.75
2.....		1.14	a	2.0	2.85	1.86	4.3	1.90	3.3	2.9	2.6	2.6
3.....		1.04	1.17	2.65	2.6	1.97	3.3	2.05	2.9	3.0	2.5	2.45
4.....		1.09	1.10	2.65	2.5	1.92	2.6	1.84	2.75	3.3	2.3	2.35
5.....		1.24	1.17	2.3	2.65	1.93	2.05	1.74	2.65	3.7	2.5	2.25
6.....		1.96	1.14	5.4	2.55	1.91	2.1	1.73	3.8	3.5	2.4	2.15
7.....		1.36	1.44	3.8	2.35	1.84	2.3	1.77	3.0	3.2	2.3	2.5
8.....		1.34	1.37	3.1	2.25	1.92	2.5	1.67	2.95	5.6	2.45	2.65
9.....	1.03	1.26	1.30	2.7	2.15	3.0	2.45	1.70	4.7	5.4	2.47	2.8
10.....		1.42	1.17	2.45	2.1	2.55	a	1.53	5.4	5.4	8.6	2.65
11.....		1.94	1.12	2.25	2.05	2.25	a	a	5.2	5.8	9.2	2.25
12.....	1.18	1.89	1.14	2.15	2.0	2.2	a	a	3.5	6.4	8.2	2.1
13.....	1.23	1.56	1.24	2.05	1.93	2.3	a	a	3.3	4.9	6.0	1.99
14.....	1.20	1.49	1.77	2.1	1.90	3.0	a	1.58	2.8	4.2	4.8	1.87
15.....	1.16	1.40	1.54	1.98	1.84	4.0	2.2	3.0	2.65	3.8	4.1	1.81
16.....	1.10	1.32	1.40	1.94	1.82	3.5	2.75	2.4	2.7	4.8	3.9	1.77
17.....	1.13	1.32	1.70	1.84	1.77	3.0	2.6	2.0	4.4	5.1	4.0	2.1
18.....	1.16	1.22	2.65	1.82	6.0	2.7	2.3	2.05	5.9	4.1	4.6	1.93
19.....	1.09	1.17	2.4	1.73	4.8	2.55	2.45	1.74	4.4	3.7	3.7	1.78
20.....	1.12	1.13	4.8	1.70	3.7	2.4	2.5	2.05	3.7	3.4	3.3	1.83
21.....	1.16	1.12	3.8	1.68	3.3	2.35	2.3	1.86	3.5	3.4	13.8	4.0
22.....	1.19	1.13	2.95	1.70	3.0	2.35	2.2	1.78	3.3	3.1	15.0	2.35
23.....	1.16	1.11	2.5	1.64	2.8	3.4	2.45	1.80	2.95	2.85	14.1	2.05
24.....	1.14	1.06	2.3	1.62	2.6	2.9	3.5	1.83	2.75	2.75	9.0	1.84
25.....	1.12	a	2.1	1.63	2.45	2.85	2.85	1.85	2.6	a	7.8	1.74
26.....	1.26	a	2.5	1.57	2.3	2.9	2.6	2.0	2.5	2.7	5.6	1.76
27.....	1.22	a	2.8	1.63	2.1	2.55	2.4	1.89	2.5	2.75	4.8	3.2
28.....	1.14	a	2.45	1.64	2.1	2.5	2.25	1.89	4.3	2.7	4.1	3.0
29.....	1.04	a	2.15	1.66	2.1	2.25	2.25		3.5	2.75	3.6	2.4
30.....	1.08	9.2	2.0	1.66	2.15	2.5	2.5		3.3	2.65	3.3	2.1
31.....	1.08	a		3.9		2.1	1.88		3.8		3.0	

a No record.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 391

Daily discharge, in second-feet, of TIOGA RIVER NEAR ERWINS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1		138	50	562	1,840	625	700	390	2,920	1,620	940	1,200
2		112	90	590	1,280	492	3,080	520	1,730	1,370	1,080	1,060
3		82	121	1,100	1,060	569	1,730	625	1,330	1,420	980	940
4		97	100	1,100	980	534	1,060	478	1,200	1,730	820	860
5		146	121	820	1,100	541	625	414	1,100	2,210	980	780
6		562	112	4,990	1,020	527	660	408	2,340	1,960	900	700
7		200	240	2,340	860	478	820	432	1,420	1,620	820	980
8		190	205	1,520	780	534	980	372	1,380	5,370	940	1,100
9	79	161	170	1,150	700	1,420	940	380	3,760	4,990	940	1,240
10		230	121	940	660	1,020	900	288	4,990	4,990	12,600	1,100
11		548	106	780	625	780	880	270	2,920	5,760	14,400	780
12	124	513	112	700	590	740	860	260	1,960	7,010	11,500	660
13	142	306	146	625	541	820	850	250	1,730	4,090	6,160	583
14	130	265	432	660	520	1,420	850	318	1,240	2,920	3,920	499
15	118	220	194	576	478	2,620	740	1,420	1,100	2,340	2,770	467
16	100	180	220	548	464	1,060	1,200	900	1,150	3,920	2,480	432
17	109	180	390	478	432	1,420	1,060	590	3,240	4,450	2,620	660
18	118	133	1,100	464	6,160	1,150	820	625	5,960	2,770	3,580	541
19	97	121	900	408	3,920	1,020	940	414	3,240	2,210	2,210	438
20	106	109	3,920	390	2,210	900	980	625	2,210	1,840	1,730	471
21	118	106	2,340	378	1,730	860	820	492	1,960	1,840	32,500	2,620
22	127	109	1,380	390	1,420	860	740	438	1,730	1,520	38,000	860
23	118	103	980	354	1,240	1,840	940	450	1,380	1,280	31,000	625
24	112	83	820	342	1,060	1,330	1,960	471	1,200	1,200	13,800	478
25	106	80	660	348	940	1,280	1,280	485	1,060	1,200	10,400	414
26	161	70	980	312	820	1,330	1,060	590	980	1,150	5,370	426
27	135	65	1,240	348	660	1,020	900	513	980	1,200	3,920	1,620
28	112	63	940	354	660	950	780	513	3,050	1,150	2,770	1,420
29	82	60	700	363	660	780	780		1,960	1,200	2,090	900
30	94	54	590	366	700	700	625		1,730	1,100	1,730	660
31	94	50		2,480		660	506		2,340		1,420	
Mean		172	653	864	1,200	1,010	1,000	498	2,110	2,590	7,040	850

NOTE.— Daily discharge, August 25 to 29 and 31 to September 2, January 10 to 14, February 11 to 13 and April 25, estimated, because of no gage height record, by comparing with hydrograph of Chemung river at Chemung, minus Cohocton river near Campbell.

Monthly discharge of TIOGA RIVER NEAR ERWINS, for the year ended June 30, 1919
[Drainage area, 1,320 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July					
August	562	50	172	0.130	0.15
September	3,920	50	653	0.495	0.55
October	4,990	312	864	0.655	0.76
November	6,160	432	1,200	0.909	1.01
December	2,620	478	1,010	0.765	0.88
January	3,080	506	1,000	0.758	0.87
February	1,420	250	498	0.377	0.39
March	5,960	980	2,110	1.60	1.84
April	7,010	1,100	2,580	1.95	2.18
May	38,000	820	7,040	5.33	6.14
June	2,620	414	850	0.644	0.72

COHOCTON RIVER

COHOCTON RIVER NEAR SAVONA

Location.—Just below the highway bridge, about $1\frac{1}{4}$ miles above the village of Savona and $4\frac{1}{2}$ miles downstream from the village of Bath, Steuben county.

Drainage area.—383 square miles. (Furnished by Mr. Robert O. Hayt.)

Records available.—March 3, 1919, to June 30, 1919.

Gage.—Standard sloping and vertical staff. Slope gage supported on concrete piers located in left bank 200 feet downstream from highway bridge. Vertical section spiked to downstream side of ash tree about 12 inches in diameter and 15 feet back from edge of bank. Read by Kenneth D. Ward.

Discharge measurements.—Made from standard cable equipment at medium and high stages; by wading just above the gage during low water.

Channel and control.—Firmly bedded gravel; not likely to shift.

Extremes of discharge.—Current year: Maximum stage recorded, 9.18 feet at 6:30 A. M., May 23; discharge, 6,900 second-feet. Minimum stage recorded, 2.25 feet from 6:45 A. M., June 25, to 6:45 A. M., June 26; discharge, 138 second-feet.

Ice.—Stage-discharge relation probably affected by ice.

Regulation.—Seasonal distribution of flow is probably not affected by small reservoirs above.

Accuracy.—Stage-discharge relation fairly permanent; probably affected by ice from December to March. Rating curve well defined up to a discharge of 6,000 second-feet.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the Lamoka Electric Power Corporation (Robert O. Hayt, Chief Engineer).

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 393

Discharge measurements of COHOCTON RIVER NEAR SAVONA, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft.</i>
July 18.....	E. D. Burchard.....	1.87	62.2
July 18.....	E. D. Burchard.....	1.86	59.3
1919			
Jan. 27.....	E. D. Burchard.....	2.39	185
Mar. 6.....	E. D. Burchard.....	2.80	311
Apr. 4.....	J. W. Moulton.....	3.32	528
Apr. 13.....	M. H. Carson.....	5.02	1,710
Apr. 14.....	M. H. Carson.....	4.40	1,170
Apr. 15.....	M. H. Carson.....	4.01	957
Apr. 20.....	M. H. Carson.....	3.22	523
May 22.....	O. W. Hartwell.....	8.40	5,740
May 25.....	O. W. Hartwell.....	6.59	3,300

Daily gage height, in feet, of COHOCTON RIVER NEAR SAVONA, for the year ended
June 30, 1919

DAY	Mar.	April	May	June	DAY	Mar.	April	May	June
1.....		2.9	3.4	3.15	16.....	3.1	4.1	3.8	2.65
2.....		2.85	3.45	3.0	17.....	4.0	3.9	4.1	3.15
3.....	2.7	2.95	3.25	2.9	18.....	4.8	3.55	3.95	2.7
4.....	2.7	3.3	3.25	2.8	19.....	4.0	3.4	3.6	2.6
5.....	2.95	3.35	3.3	2.7	20.....	3.75	3.25	3.4	2.55
6.....	2.9	3.0	3.1	2.65	21.....	3.5	3.25	3.1	2.5
7.....	2.6	3.1	3.05	3.45	22.....	3.3	3.05	3.4	2.39
8.....	2.6	3.2	3.0	3.2	23.....	3.1	2.9	3.6	2.24
9.....	3.5	3.7	3.0	3.7	24.....	3.0	3.3	7.5	2.29
10.....	3.7	4.8	6.5	3.7	25.....	2.9	3.25	6.6	2.25
11.....	3.4	5.4	7.0	3.3	26.....	2.8	3.25	5.5	2.32
12.....	3.2	5.8	6.3	3.0	27.....	2.85	3.2	4.7	2.7
13.....	3.1	5.1	5.4	2.8	28.....	3.2	3.3	4.2	2.6
14.....	2.6	4.5	4.5	2.7	29.....	3.05	3.8	3.75	2.42
15.....	2.7	4.0	4.1	2.65	30.....	3.05	3.5	3.5	2.29
					31.....	3.3		3.3	

NOTE.—Record began March 3, 1919.

**Daily discharge, in second-feet, of COHOCTON RIVER NEAR SAVONA, for the year ended
June 30, 1919**

DAY	Mar.	April	May	June	DAY	Mar.	April	May	June
1.....	650	358	595	470	16.....	445	1,000	815	264
2.....	380	338	620	400	17.....	935	575	1,000	470
3.....	282	379	520	358	18.....	1,520	672	905	282
4.....	282	545	520	319	19.....	935	595	700	247
5.....	379	570	545	282	20.....	785	520	595	230
6.....	358	400	445	264	21.....	645	520	5,270	214
7.....	247	445	422	620	22.....	545	422	5,700	179
8.....	214	495	400	495	23.....	445	358	6,000	164
9.....	645	755	400	755	24.....	400	545	4,440	149
10.....	755	1,520	3,200	755	25.....	358	520	3,310	138
11.....	595	2,060	3,790	545	26.....	319	520	2,150	158
12.....	495	2,450	2,950	400	27.....	338	495	1,440	282
13.....	445	1,780	2,060	319	28.....	495	545	1,060	247
14.....	247	1,280	1,280	282	29.....	422	815	785	188
15.....	282	935	1,000	264	30.....	422	645	645	149
					31.....	545	.....	545	.....
					Mean.....	510	779	1,750	330

NOTE.— Daily discharge estimated, March 1 and 2, by comparing with hydrograph of Cohocton river near Campbell.

**Monthly discharge of COHOCTON RIVER NEAR SAVONA, for the year ended June 30,
1919**

[Drainage area, 383 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
March.....	1,520	214	510	1.33	1.53
April.....	2,450	338	779	2.03	2.26
May.....	6,000	400	1,750	4.57	5.27
June.....	755	138	330	0.862	0.96

COHOCTON RIVER NEAR CAMPBELL

Location.—At the highway bridge, known locally as Red bridge, nearly 2 miles upstream from the town of Campbell, Steuben county, and about midway between Campbell and Savona.

Drainage area.—480 square miles. (Furnished by Mr. Robert O. Hayt.)

Records available.—July 11, 1918, to June 30, 1919.

Gage.—Standard chain gage secured to the downstream hand-rail of the bridge near the left abutment. Read by Miss Dora Wood.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Firmly-bedded gravel; not likely to shift.

Extremes of discharge.—Current year: Maximum stage recorded, 7.75 feet at 7:30 A. M., May 23; discharge, 9,280 second-feet. Minimum stage recorded, 0.67 foot, several times in September; discharge, 60 second-feet.

Ice.—Stage-discharge relation probably affected by ice.

Regulation.—Seasonal distribution of flow is probably not affected by small reservoirs above.

Accuracy.—Stage-discharge relation practically permanent. Usually affected by ice from December to March. Rating curve well defined for discharges up to 6,500 second-feet.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the Lamoka Electric Power Corporation (Robert O. Hayt, Chief Engineer).

Discharge measurements of COHOCTON RIVER NEAR CAMPBELL, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-f.
July 17.....	E. D. Burchard.....	0.82	94.2
July 17.....	E. D. Burchard.....	0.82	91.3
July 19.....	E. D. Burchard.....	0.85	105
Aug. 18.....	C. C. Covert.....	0.72	68.5
Nov. 21.....	E. D. Burchard.....	1.94	611
Nov. 21.....	E. D. Burchard.....	1.92	602
Dec. 28.....	C. C. Covert.....	1.46	298
1919			
Jan. 27.....	E. D. Burchard.....	1.23	225
Mar. 6.....	E. D. Burchard.....	1.54	375
Apr. 4.....	J. W. Moulton.....	1.97	639
Apr. 13.....	M. H. Carson.....	3.45	1,990
Apr. 14.....	M. H. Carson.....	3.07	1,630
Apr. 21.....	M. H. Carson.....	2.03	666
May 22.....	O. W. Hartwell.....	6.46	6,600
May 25.....	O. W. Hartwell.....	4.95	3,900

Daily gage height, in feet, of COHOCTON RIVER NEAR CAMPBELL, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		0.91	0.86	1.14	1.65	1.14	1.39	1.11	2.1	1.7	2.1	1.9
2.....		0.81	0.71	1.12	1.65	1.33	1.95	1.6	1.7	1.7	2.1	1.8
3.....		0.81	0.71	1.12	1.5	1.15	1.7	1.38	1.5	1.7	1.95	1.7
4.....		0.92	0.70	1.14	1.47	1.15	1.48	1.16	1.6	2.05	1.95	1.6
5.....		0.81	0.70	1.06	1.47	1.19	1.48	1.18	1.6	2.05	2.0	1.6
6.....		0.83	0.82	1.08	1.37	1.05	1.7	1.15	1.6	2.0	1.8	1.5
7.....		0.89	0.91	1.18	1.30	1.28	2.1	1.24	1.41	2.0	1.85	2.1
8.....		0.84	0.78	1.16	1.26	1.20	2.25	1.25	1.39	2.0	1.8	1.9
9.....		0.81	0.70	1.16	1.28	1.85	1.7	1.18	2.15	2.35	1.8	2.05
10.....		0.85	0.68	1.11	1.22	1.65	2.1	1.01	2.4	3.2	4.2	2.4
11.....	0.95	0.84	0.74	1.04	1.21	1.65	2.05	1.11	2.05	3.0	5.1	2.1
12.....	1.03	0.83	0.70	1.06	1.22	1.48	2.1	1.65	1.76	4.2	4.7	1.95
13.....	0.97	0.76	0.82	1.07	1.20	1.44	2.35	1.22	1.9	3.5	3.9	1.8
14.....	0.89	0.77	0.88	1.01	1.12	2.1	1.95	1.35	1.41	3.1	3.3	1.6
15.....	0.83	0.80	0.76	1.02	1.13	2.4	1.9	1.5	1.7	2.8	2.8	1.5
16.....	0.87	0.76	0.73	1.00	1.08	2.1	1.7	1.29	1.8	2.8	2.5	1.55
17.....	0.86	0.76	0.98	0.97	1.11	1.95	1.6	1.35	2.6	2.6	3.1	1.7
18.....	0.84	0.73	1.10	0.98	2.9	1.76	1.5	1.12	3.3	2.7	2.7	1.55
19.....	0.85	0.74	1.41	0.98	2.5	1.6	1.49	1.09	2.6	2.15	2.4	1.41
20.....	0.83	0.72	2.05	0.97	2.15	1.5	1.6	1.30	2.4	2.0	2.1	1.40
21.....	0.78	0.73	1.85	1.02	1.95	1.45	1.5	1.14	2.2	2.0	6.0	1.39
22.....	0.75	0.71	1.55	1.01	1.85	1.5	1.35	1.06	2.2	1.8	6.4	1.29
23.....	0.76	0.77	1.37	1.01	1.65	1.7	1.45	1.14	2.1	1.7	6.7	1.24
24.....	0.83	0.72	1.31	0.91	1.55	1.6	1.7	1.11	1.9	2.0	5.6	1.18
25.....	1.23	0.70	1.26	0.92	1.43	1.75	1.6	1.06	1.65	2.0	5.0	1.15
26.....												
27.....	1.04	0.72	1.46	1.10	1.38	1.65	1.41	1.15	1.6	1.9	4.1	1.29
28.....	0.88	0.71	1.42	1.13	1.33	1.35	1.39	1.08	1.6	2.25	3.4	1.6
29.....	0.91	0.70	1.31	1.04	1.25	1.46	1.26	1.7	1.95	2.1	2.8	1.5
30.....	0.84	0.70	1.22	1.03	1.29	1.46	1.22		1.9	2.3	2.45	1.23
31.....	0.99	0.73	1.12	1.08	1.32	1.38	1.19		1.85	2.1	2.25	1.19
	0.98	0.73		2.16		1.45	1.08		2.0		2.05	

NOTE.— Record began July 11, 1918.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 397

Daily discharge, in second feet, of COHOCTON RIVER NEAR CAMPBELL, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		117	104	193	430	193	298	182	725	457	725	581
2.....		92	68	186	430	270	616	402	457	457	725	517
3.....		92	68	186	350	197	457	293	350	457	616	457
4.....		120	66	193	336	197	340	201	350	888	616	402
5.....		92	66	164	336	212	320	208	402	638	650	402
6.....		96	94	171	288	161	320	197	402	650	517	350
7.....		112	117	208	257	249	400	232	307	650	549	725
8.....		99	84	201	241	216	500	236	298	650	517	581
9.....		92	66	201	249	549	400	208	762	915	517	688
10.....		102	62	182	224	430	480	147	955	1,700	2,900	955
11.....	129	90	75	158	220	430	460	182	688	1,500	4,220	725
12.....	154	96	66	164	224	340	440	430	437	2,900	3,610	616
13.....	135	80	94	168	216	321	420	224	581	2,030	2,610	517
14.....	112	82	109	147	186	725	380	290	307	1,600	1,810	402
15.....	96	89	80	151	189	955	360	350	457	1,310	1,310	350
16.....	106	80	73	144	171	725	340	253	517	1,310	1,040	376
17.....	104	80	139	135	182	616	320	280	1,130	1,130	1,600	457
18.....	99	73	178	138	1,400	437	300	186	1,810	1,220	1,220	376
19.....	102	75	307	138	1,040	402	345	175	1,130	762	955	807
20.....	96	71	693	135	762	350	402	257	955	650	725	302
21.....	84	73	553	151	620	326	350	193	800	650	5,720	298
22.....	78	68	376	147	549	350	280	164	800	517	6,470	253
23.....	84	82	248	147	430	457	326	193	725	457	7,060	232
24.....	96	71	262	117	376	402	457	182	581	650	5,030	208
25.....	223	66	241	120	316	487	402	164	430	650	4,060	197
26.....	158	71	331	178	293	430	307	197	402	581	2,770	253
27.....	109	68	312	189	270	280	298	171	402	838	1,920	402
28.....	117	66	252	153	236	331	241	457	616	725	1,310	350
29.....	99	66	224	154	253	331	224	.....	581	875	998	249
30.....	141	73	189	171	206	293	212	.....	549	725	838	212
31.....	108	73	.....	762	.....	326	171	.....	650	.....	688	.....
Mean.....	.....	84.4	188	182	378	388	360	237	632	946	2,070	421

NOTE.—Stage-discharge relation probably affected by ice, January 5 to 18, inclusive.

Monthly discharge of COHOCTON RIVER NEAR CAMPBELL, for the year ended June 30, 1919

[Drainage area, 480 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
August.....	120	66	84.4	0.176	0.20
September.....	688	62	183	0.392	0.44
October.....	762	117	182	0.379	0.44
November.....	1,400	171	378	0.788	0.88
December.....	955	101	388	0.808	0.93
January.....	616	171	360	0.750	0.86
February.....	457	147	237	0.494	0.51
March.....	1,810	298	632	1.32	1.52
April.....	2,900	457	946	1.97	2.20
May.....	7,060	517	2,070	4.31	4.97
June.....	955	180	421	0.877	0.98

MUD CREEK, STEUBEN COUNTY

MUD CREEK AT SAVONA

Location.—On the farm of L. R. Travis in the town of Savona, Steuben county; about half a mile above the mouth.

Drainage area.—80 square miles. (Furnished by Mr. Robert O. Hayt.)

Records available.—July 8, 1918, to June 30, 1919.

Gage.—Vertical staff secured to 8-inch by 8-inch timber planted in concrete at the water's edge on the left bank 150 feet upstream from farm bridge. Read by L. R. Travis.

Discharge measurements.—Made by wading at the gage or from farm bridge.

Channel and control.—Fairly well compacted gravel and not likely to shift. Considerable grass growth in stream bed. Control probably submerged by backwater from the Cohocton river during extreme floods.

Extremes of discharge.—Current year: Maximum stage recorded, 6.65 feet at 6:45 A. M., May 23; discharge, 852 second-feet. Minimum stage recorded, 3.38 feet at 7:15 P. M., October 19; discharge, 9.5 second-feet.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Grist mills at Bradford, 7 miles upstream, cause some diurnal fluctuation in flow.

Accuracy.—Stage-discharge relation poorly defined; affected by ice from December to March and by aquatic growth from June to November.

Coöperation.—Station established by the Lamoka Electric Power Company under the direction of the United States Geological Survey. Maintained by the Survey in coöperation with the Power Co. and the State of New York.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 399

Discharge measurements of MUD CREEK AT SAVONA, during the year ended June 30, 1919

DATE	Made by	Gage height	Discharge
1918		<i>Feet</i>	<i>Sec.-ft</i>
July 19.....	E. D. Burchard.....	3.53	13.4
Aug. 18.....	C. C. Covert.....	3.49	14.3
Nov. 21.....	E. D. Burchard.....	3.69	38.4
Nov. 21.....	E. D. Burchard.....	3.69	39.6
1919			
Jan. 27.....	E. D. Burchard.....	3.59	30.5
Apr. 4.....	J. W. Moulton.....	3.98	70.8
Apr. 13.....	M. H. Carson.....	4.88	212
Apr. 14.....	M. H. Carson.....	4.75	187
Apr. 15.....	M. H. Carson.....	4.65	170
Apr. 20.....	M. H. Carson.....	4.02	72.3
May 22.....	O. W. Hartwell.....	5.76	401
May 25.....	O. W. Hartwell.....	6.40	746
May 26.....	O. W. Hartwell.....	5.90	548

Daily gage height, in feet, of MUD CREEK AT SAVONA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		3.54	3.60	3.57	3.63	3.52	3.66	3.58	3.76	3.86	4.0	3.92
2.....		3.52	3.46	3.52	3.62	3.54	3.86	3.62	3.56	3.91	3.94	3.94
3.....		3.50	3.48	3.50	3.58	3.62	3.78	3.57	3.56	3.84	3.92	3.94
4.....		3.58	3.53	3.58	3.51	3.58	3.78	3.55	3.58	3.94	3.92	3.89
5.....		3.54	3.50	3.48	3.56	3.54	3.70	3.54	3.67	4.0	3.98	3.92
6.....		3.58	3.48	3.48	3.51	3.51	3.60	3.54	3.65	3.92	3.92	3.86
7.....		3.56	3.50	3.52	3.50	3.66	3.58	3.56	3.65	3.90	3.88	4.45
8.....	3.54	3.52	3.52	3.49	3.48	3.58	3.62	3.50	3.55	3.92	3.90	4.1
9.....	3.56	3.54	3.47	3.45	3.48	3.68	3.66	3.52	4.05	4.00	4.05	4.1
10.....	3.63	3.62	3.48	3.43	3.51	3.58	3.58	3.52	4.35	4.35	5.2	4.25
11.....	3.59	3.52	3.47	3.50	3.51	3.55	3.61	3.52	3.94	5.0	5.6	4.5
12.....	3.66	3.50	3.47	3.58	3.52	3.66	3.53	3.54	3.84	5.1	5.8	4.35
13.....	3.60	3.50	3.58	3.56	3.46	3.64	3.58	3.48	3.84	4.9	5.8	4.1
14.....	3.62	3.62	3.48	3.42	3.47	3.81	3.64	3.58	3.69	4.75	5.4	3.94
15.....	3.54	3.51	3.42	3.44	3.45	3.95	3.71	3.62	3.64	4.65	4.6	3.85
16.....	3.54	3.60	3.40	3.45	3.42	3.87	3.60	3.54	3.98	4.65	4.25	3.95
17.....	3.54	3.63	3.50	3.40	3.49	3.74	3.62	3.57	4.4	4.65	4.4	4.0
18.....	3.54	3.50	3.59	3.44	4.25	3.65	3.65	3.54	4.45	4.5	4.35	3.83
19.....	3.52	3.48	3.47	3.41	4.0	3.61	3.64	3.48	4.1	4.4	4.15	3.71
20.....	3.58	3.50	4.25	3.44	3.80	3.57	3.62	3.56	4.05	4.0	3.95	3.72
21.....	3.56	3.52	4.05	3.39	3.71	3.62	3.62	3.52	4.05	4.1	5.1	3.64
22.....	3.50	3.52	3.70	3.50	3.65	3.67	3.62	3.52	4.7	4.0	5.5	3.64
23.....	3.51	3.66	3.55	3.41	3.65	3.76	3.67	3.54	4.6	3.96	6.6	3.61
24.....	3.72	3.48	3.56	3.42	3.60	3.72	3.76	3.52	4.25	4.05	6.3	3.58
25.....	4.05	3.46	3.56	3.42	3.58	3.70	3.70	3.54	3.86	3.98	6.4	3.58
26.....	3.76	3.47	3.76	3.48	3.60	3.72	3.62	3.53	3.75	4.0	5.9	3.68
27.....	3.60	3.60	3.68	3.48	3.60	3.62	3.64	3.57	3.85	3.96	5.1	2.74
28.....	3.54	3.49	3.59	3.40	3.52	3.62	3.60	3.61	4.1	4.0	4.5	3.66
29.....	3.52	3.50	3.57	3.50	3.58	3.65	1.60		3.98	4.0	4.2	3.62
30.....	3.62	3.50	3.48	3.61		3.62	3.60		3.96	3.96	4.0	3.56
31.....	3.62	3.48		4.00		3.64	3.52		4.0		3.96	

NOTE.—Record began July 8, 1918.

Daily discharge, in second-feet, of MUD CREEK AT SAVONA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		18	20	20	34	25	36	29	46	57	73	63
2.....		17	12	16	30	26	57	33	28	62	66	66
3.....		15	13	15	26	33	48	29	28	54	63	66
4.....		20	16	20	20	29	48	27	29	66	63	60
5.....		18	14	14	24	26	40	26	37	73	71	63
6.....		20	13	14	22	24	31	26	36	63	63	57
7.....		20	14	17	20	36	29	28	36	61	59	136
8.....	20	17	15	15	20	29	33	23	27	63	61	86
9.....	20	18	12	13	20	38	36	25	80	73	80	86
10.....	26	24	13	12	22	29	29	25	120	120	300	106
11.....	24	17	12	16	22	27	32	25	66	240	435	144
12.....	30	15	12	22	24	36	25	26	54	270	510	120
13.....	24	15	20	20	20	35	29	22	54	216	510	86
14.....	24	24	13	11	20	51	35	29	39	188	365	66
15.....	19	15	15	12	20	67	41	33	35	170	161	56
16.....	19	22	8	14	17	58	31	26	71	170	106	67
17.....	19	24	14	11	22	44	33	29	128	170	128	73
18.....	19	15	20	13	106	36	36	26	138	144	120	53
19.....	17	14	12	12	73	32	35	22	86	128	92	41
20.....	22	15	90	14	50	29	33	28	80	73	67	42
21.....	20	16	65	11	41	33	33	25	80	86	220	35
22.....	16	16	30	18	36	37	33	25	179	80	360	35
23.....	17	26	18	12	36	46	37	26	161	68	700	32
24.....	32	14	19	13	31	42	46	25	106	80	705	29
25.....	65	12	19	13	29	40	40	26	57	71	745	29
26.....	36	13	36	17	31	42	33	25	45	73	550	38
27.....	24	22	28	17	31	33	35	29	56	68	270	44
28.....	18	14	20	12	25	33	31	32	86	73	144	36
29.....	17	15	20	19	29	36	31	.....	71	73	99	33
30.....	24	15	14	20	32	33	31	.....	68	68	73	28
31.....	24	14	.....	65	.....	35	25	.....	73	.....	68	.....
Mean.....	.....	17.4	20.9	16.7	31.1	36.1	35.2	26.8	70.9	107	236	62.5

NOTE.—Stage-discharge relation affected by growth on control, October 1 to November 14; also by backwater from Cohocton river, May 21 to 23. Daily discharge for these periods is approximate.

Monthly discharge of MUD CREEK AT SAVONA, for the year ended June 30, 1919
[Drainage area, 80 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	65	16	.....	.....	.....
August.....	26	12	17.4	0.218	0.25
September.....	90	8	20.9	0.261	0.29
October.....	65	11	16.7	0.209	0.24
November.....	106	17	31.1	0.388	0.43
December.....	67	24	36.1	0.451	0.52
January.....	57	25	35.2	0.440	0.51
February.....	33	22	26.8	0.335	0.35
March.....	179	27	70.9	0.886	1.03
April.....	270	54	107	1.34	1.50
May.....	745	50	236	2.95	3.40
June.....	144	28	62.5	0.781	0.87

ALLEGHENY RIVER DRAINAGE BASIN

ALLEGHENY RIVER

DESCRIPTION

Allegheny river drains the western slopes of the Allegheny mountains in Pennsylvania and New York.

The river rises in the central part of Potter county, in northern Pennsylvania, flows in a general northwesterly direction into New York to about the central part of Cattaraugus county, where it turns and flows southwestward back into Pennsylvania. At Franklin, in Venango county, it turns and flows southeastward to the mouth of Mahoning creek, in Armstrong county, where it again bends to the southwest, and at Pittsburgh joins the Monongahela to form the Ohio. The river is about 290 miles long (map measurement) and its drainage area, which is nearly 50 per cent greater than that of the Monongahela, comprises about 11,100 square miles.

The noteworthy tributaries in New York are Oswayo, Olean and Tunugwant creeks. Oswayo and Tunugwant creeks rise in Pennsylvania. Two other important creeks—Conewango and Brokenstraw—have their sources in New York state, but are tributary to the main stream at points in Pennsylvania.

The elevation of the sources of the river is about 2,500 feet above sea-level. At Olean, N. Y., the elevation is 1,420 feet; at Franklin, Pa., the elevation is 960 feet; at Pittsburgh, Pa., the elevation is 692 feet.

The basin is somewhat regular in shape, being about $2\frac{1}{2}$ times as long as it is wide. Its northwestern boundary is, at one point, about 8 miles from Lake Erie, lying within about 40 miles of Buffalo. Below Franklin, Pa., the river flows near the western boundary of its basin. The surrounding country is made up of high hills or mountains separated by deep valleys, but west of the main river the country is less mountainous, though the surface is still rolling and hilly.

The bed of the stream is composed chiefly of gravel, ranging in size from small pebbles to cobblestones. The banks are made up of sand, gravel or clay. The area is underlaid by shales and except in stream valleys the soil has little depth.

This basin is exceptionally rich in natural resources—coal, oil, gas, limestone, glass sand and building stones, which occur in abundance.

This basin was at one time covered with timber, the principal varieties being pine and hemlock. At present, however, only light forests and brush are found at the headwaters of the tributaries, the pine and hemlock having been cut off some time ago.

The mean annual rainfall in this region is about 40 inches and the winters are severe. Snowfall is heavy in the upper part of the basin and lasts for long periods, and ice forms to a thickness of about 2 feet. The heavy ice during the spring floods is very destructive. Jams frequently occur, which cause considerable damage from backwater.

Allegheny river is subject to very severe floods, which cause heavy losses to manufacturing and other interests along the river.

The fall of the main river and tributaries is comparatively large and if the stream were in a district where fuels were more expensive, it would undoubtedly be much used for power. When the price of coal advances, so that water-power can compete with steam, the water-power on this stream will be more extensively developed.

The Cuba reservoir, which feeds the Erie canal through Genesee river, lies on the divide between the Allegheny and Genesee drainage basins. Part of the overflow from this reservoir passes into the Allegheny and the rest into the Genesee.

ALLEGHENY RIVER AT RED HOUSE

Location.—At highway bridge in Red House, Cattaraugus county, about 5 miles below Salamanca and 13 miles above the boundary between New York and Pennsylvania. Conewango creek, the outlet of Chautauqua lake, enters the Allegheny in Pennsylvania about 30 miles below the station.

Drainage area.—1,640 square miles.

Records available.—September 4, 1903, to June 30, 1919.

Gage.—Gurley 7-day graph water-stage recorder on the left bank just below the highway bridge, installed September 3, 1917; inspected by Mr. W. E. Coe.

Prior to this date chain gage attached to the upstream side of bridge near left end.

Discharge measurements.—Made from downstream side of bridge.

Channel and control.—Coarse gravel, occasionally shifting. Current good for medium and high stages, slow at low stages.

Extremes of discharge.—Current year: Maximum stage from water-stage recorder, 10.12 feet at noon, May 23; discharge, about 21,400 second-feet. Minimum stage from water-stage recorder, 3.09 feet at 5 P. M., July 24; discharge, 254 second-feet.

1903-1919: Maximum stage recorded, 12.7 feet, March 26, 1913; discharge, 40,000 second-feet. Minimum stage recorded, 2.7 feet on several days in December, 1908; discharge, about 100 second-feet.

Ice.—Stage-discharge relation somewhat affected by ice.

Regulation.—Low-water flow may be slightly affected by the operation of several small power-plants above Salamanca. A storage reservoir on the divide between Oil creek, tributary to Allegheny river, and Genesee river, tributary to Lake Ontario, was formerly used for supplying water to the Erie canal system through the abandoned Genesee River canal and the Genesee river. This reservoir is no longer used for canal purposes. Water is all turned into Allegheny through Olean creek.

Accuracy.—Stage-discharge relation practically permanent between dates of shifting. Affected by ice during a large part of the period from December to February, inclusive. Rating curve well defined between 300 and 900 second-feet and between 6,000 and 15,000 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table. Daily gage height obtained from automatic record by inspection. Results good except for periods when the stage-discharge relation was affected by ice, when results were fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Conservation Commission.

Discharge measurements of ALLEGHENY RIVER AT RED HOUSE, during the year ended
June 30, 1919

DATE	Made by	Gage height	Discharge
1918		Feet	Sec.-ft.
Aug. 22.....	E. D. Burchard.....	3.22	408
1919			
April 18.....	M. H. Carson.....	6.01	5,570
May 17.....	J. W. Moulton.....	6.46	6,820
June 18.....	J. W. Moulton.....	3.77	905

Daily gage height, in feet, of ALLEGHENY RIVER AT RED HOUSE, for the year ended
June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3.87	3.55	3.45	4.20	6.95	4.40	a	4.14	a	4.46	4.90	4.80
2.....	3.81	3.39	3.59	4.15	6.5	4.27	6.9	3.90	5.35	4.41	5.05	4.59
3.....	3.74	3.29	3.55	4.23	6.1	4.28	6.5	3.93	4.86	4.37	5.05	4.40
4.....	3.64	3.37	3.47	4.35	6.05	4.30	5.9	4.10	4.71	4.37	5.0	4.27
5.....	3.57	4.25	3.50	4.30	6.25	4.24	5.45	4.01	4.78	4.48	5.15	4.16
6.....	3.54	4.13	4.26	4.25	5.75	4.20	5.15	3.86	5.0	4.50	5.05	4.13
7.....	3.46	3.79	4.14	4.58	5.4	4.17	5.06	3.78	4.96	4.43	5.05	4.13
8.....	3.42	3.69	3.86	5.1	5.15	a	5.1	3.80	4.87	4.66	5.25	4.11
9.....	3.40	3.91	3.71	4.87	5.0	5.9	5.0	3.70	a	5.7	5.25	4.10
10.....	3.40	3.83	3.61	4.71	4.91	5.4	4.56	3.76	6.4	a	a	4.20
11.....	3.44	3.80	3.52	4.55	4.82	5.1	4.50	3.77	6.0	7.8	9.6	4.06
12.....	3.43	3.95	3.49	1.45	4.63	5.15	4.35	3.73	5.6	8.0	8.9	3.89
13.....	3.40	3.93	4.06	4.52	4.51	5.1	4.30	a	5.45	7.7	7.9	3.77
14.....	3.35	3.77	4.72	4.46	4.44	5.65	4.38	4.49	5.1	7.2	7.1	3.71
15.....	3.30	3.86	4.32	4.40	4.35	6.55	4.52	4.50	4.90	6.6	6.95	3.73
16.....	3.27	3.89	4.21	4.30	4.26	6.25	4.46	4.50	4.99	6.35	5.95	3.89
17.....	3.25	3.76	5.1	4.19	4.47	5.85	4.33	4.37	6.0	6.2	6.25	3.81
18.....	3.22	3.61	5.35	4.10	5.15	5.5	4.27	4.10	6.65	6.0	6.65	3.86
19.....	3.20	3.51	4.87	a	5.9	5.25	4.26	4.02	6.5	5.75	6.15	3.69
20.....	3.16	3.43	5.25	a	5.95	5.0	4.14	3.82	6.0	5.5	a	3.61
21.....	3.15	3.39	5.75	a	5.85	4.85	4.13	3.76	5.7	5.45	a	a
22.....	3.13	3.33	5.5	a	5.65	4.67	4.11	a	5.45	5.25	9.6	4.28
23.....	3.11	3.31	5.15	a	5.4	4.38	4.21	a	5.2	5.0	10.0	3.90
24.....	3.15	3.29	4.85	a	5.15	4.26	4.88	a	4.99	5.25	9.8	3.70
25.....	3.98	3.26	4.66	a	4.96	4.46	4.91	a	4.82	5.3	9.2	3.59
26.....	3.89	3.21	4.60	a	4.79	4.26	4.73	a	4.69	5.15	8.2	3.70
27.....	3.59	3.20	4.71	4.93	4.62	a	4.62	a	4.60	5.2	7.3	4.19
28.....	3.41	3.16	4.65	4.79	4.51	5.2	4.50	4.18	4.72	5.2	6.55	4.40
29.....	3.31	3.27	4.45	5.15	4.55	5.05	4.44	.....	4.75	5.25	5.85	4.15
30.....	3.63	3.48	4.28	5.35	4.56	5.05	4.36	.....	4.63	5.05	5.4	3.90
31.....	3.58	3.45	.....	a	.....	4.79	4.22	.....	4.55	.....	5.0	.....

a No record.

GAGING OF STREAMS: ALLEGHENY RIVER BASIN 405

Daily discharge, in second-feet, of ALLEGHENY RIVER AT RED HOUSE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	992	635	538	1,480	8,070	1,770	3,750	1,370	3,230	1,870	2,680	2,480
2.....	918	481	675	1,380	6,690	1,580	7,910	1,030	3,680	1,790	2,980	2,090
3.....	836	392	635	1,500	5,560	1,580	6,690	1,070	2,600	1,720	2,980	1,770
4.....	727	483	556	1,690	5,420	1,610	5,030	1,310	2,310	1,720	2,880	1,560
5.....	655	1,540	585	1,610	5,970	1,520	3,900	1,180	2,440	1,910	3,200	1,400
6.....	625	1,360	1,550	1,540	4,640	1,460	3,200	980	2,880	1,940	2,980	1,360
7.....	547	894	1,370	2,640	3,780	1,420	2,980	882	2,800	1,820	2,980	1,360
8.....	509	780	980	3,090	3,200	2,390	3,090	905	2,620	2,220	3,420	1,320
9.....	490	1,040	802	2,620	2,880	5,030	2,880	790	4,030	4,520	3,420	1,310
10.....	490	942	696	2,310	2,700	3,780	2,040	859	6,400	7,030	10,400	1,460
11.....	528	905	605	2,020	2,520	3,090	1,940	870	5,290	11,000	18,800	1,250
12.....	518	894	576	1,860	2,160	3,200	1,690	824	4,270	14,100	15,400	1,020
13.....	490	1,070	1,250	1,970	1,960	3,090	1,610	1,070	3,900	10,600	11,400	870
14.....	445	870	2,330	1,870	1,840	4,400	1,740	1,920	3,090	8,900	8,560	802
15.....	400	980	1,640	1,770	1,690	6,840	1,970	1,940	2,680	6,990	8,070	824
16.....	378	1,020	1,480	1,610	1,550	5,970	1,870	1,940	2,880	6,260	5,160	1,020
17.....	362	859	3,090	1,440	1,890	4,900	1,660	1,720	5,29	5,830	5,970	918
18.....	340	696	3,660	1,310	3,200	4,020	1,560	1,310	7,140	5,290	7,140	980
19.....	325	595	2,620	1,300	5,030	3,420	1,550	1,190	6,690	4,640	5,700	780
20.....	299	518	3,420	1,300	5,160	2,880	1,370	930	5,290	4,020	5,650	696
21.....	292	481	4,640	1,500	4,900	2,580	1,360	859	4,520	3,900	13,200	1,910
22.....	280	427	4,020	1,500	4,400	2,240	1,320	900	3,900	3,420	18,800	1,580
23.....	266	409	3,200	1,400	3,780	1,740	1,480	950	3,310	2,880	20,800	1,030
24.....	292	392	2,580	1,400	3,200	1,550	2,640	1,000	2,860	3,420	19,800	790
25.....	1,140	370	2,220	1,300	2,800	1,870	2,700	1,100	2,620	3,540	16,800	675
26.....	1,020	332	2,110	2,000	2,460	1,550	2,350	1,000	2,270	3,200	12,500	790
27.....	675	325	2,310	2,740	2,150	2,680	2,150	1,100	2,110	3,310	9,250	1,440
28.....	500	299	2,200	2,460	1,960	3,310	1,940	1,430	2,330	3,310	6,840	1,770
29.....	409	378	1,860	3,200	2,020	2,980	1,840	.....	2,380	3,420	4,900	1,380
30.....	716	566	1,680	3,660	2,040	2,980	1,710	.....	2,160	2,980	3,780	1,030
31.....	665	538	.....	8,040	.....	2,460	1,490	.....	2,020	.....	2,880	.....
Mean...	553	699	1,860	2,110	3,520	2,900	2,560	1,160	3,540	4,680	8,360	1,260

NOTE.— Daily discharge, October 19 to 26 and February 22 to 27, estimated, because of no gage height record, by comparing gage-height record with that of Cattaraugus creek at Versailles.

Monthly discharge of ALLEGHENY RIVER AT RED HOUSE, for the year ended June 30, 1919

(Drainage area, 1,640 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,140	266	553	0.337	0.39
August.....	1,540	299	699	0.426	0.49
September.....	4,640	538	1,890	1.13	1.26
October.....	8,040	1,300	2,110	1.29	1.49
November.....	8,070	1,550	3,520	2.15	2.40
December.....	6,840	1,420	2,900	1.77	2.04
January.....	7,910	1,320	2,580	1.56	1.80
February.....	1,940	790	1,160	0.708	0.74
March.....	7,140	2,020	3,540	2.16	2.49
April.....	14,100	1,720	4,580	2.79	3.11
May.....	20,800	2,680	8,360	5.10	5.88
June.....	2,480	675	1,260	0.768	0.86
The year.....	20,800	266	2,758	1.68	22.95

CHADAKOIN RIVER

DESCRIPTION

Chadakoin river is the outlet of Chautauqua lake. It follows a winding course for about 18 miles, having a general easterly direction, to its junction with Conewango creek, which rises in the northerly parts of Chautauqua and Cattaraugus counties and flows in a southerly direction, entering the Allegheny river in the state of Pennsylvania.

Chautauqua lake, about 16 miles long and 1 to 2 miles wide, occupies a deep valley in the highlands which rise abruptly a few miles to the southeast of Lake Erie. The surface of the lake is about 735 feet above Lake Erie and 1,308 feet above sea-level, while the surrounding hills rise 600 to 800 feet higher. There are numerous small streams entering the lake, of which Prendergast creek is the largest.

The principal tributary of Chadakoin river is Cassadaga creek, entering from the north about 4 miles below Jamestown. The river has a total fall of about 70 feet from the lake surface to its junction with Conewango creek.

CHADAKOIN RIVER AT BOAT LANDING, JAMESTOWN

Gage No. 226

This station, established July 31, 1915, is located opposite the boat landing at the Fairmount avenue bridge over Chadakoin river about 3 miles below the foot of Chautauqua lake. The gage, No. 226, is a staff having a range of 9 feet, between elevations 1,306.0 and 1,315.0 (U. S. G. S. datum), secured to a pile about 60 feet upstream from the Fairmount avenue bridge near the right bank of the stream. The gage is read once daily to tenths, with occasional readings to half-tenths.

Daily elevation of water-surface (U. S. G. S. datum) of CHADAKOH RIVER at BOAT LANDING, JAMESTOWN, for the year ended June 30, 1919.
 Horace S. Butts, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1	1,308.4	1,308.0	1,307.7	1,307.85	1,308.3	1,308.85	1,309.3	1,309.25	1,308.45	1,308.2	1,308.7
2	1,308.5	1,308.0	1,307.65	1,307.85	1,308.55	1,308.8	1,309.0	1,309.2	1,308.4	1,308.2	1,308.95
3	1,308.25	1,307.9	1,307.6	1,307.9	1,308.6	1,308.9	1,309.0	1,309.1	1,308.4	1,308.15	1,308.9
4	1,308.2	1,307.85	1,307.7	1,307.9	1,308.75	1,308.8	1,309.5	1,309.1	1,308.4	1,308.1	1,308.55
5	1,308.2	1,307.85	1,307.75	1,307.9	1,308.9	1,308.9	1,309.5	1,309.0	1,308.4	1,308.1	1,308.95
6	1,308.2	1,307.85	1,307.8	1,307.95	1,308.9	1,308.9	1,309.5	1,309.0	1,308.35	1,308.0	1,308.85
7	1,308.2	1,307.8	1,307.75	1,307.95	1,308.9	1,308.8	1,309.5	1,309.0	1,308.3	1,307.95	1,308.95
8	1,308.2	1,307.9	1,307.75	1,307.95	1,308.9	a	1,309.45	1,308.85	1,308.3	1,308.1	1,309.0
9	1,308.2	1,308.0	1,307.75	1,307.95	1,308.85	a	1,309.4	1,308.7	a	1,308.15	1,308.9
10	1,308.2	1,308.0	1,307.7	1,307.95	1,308.9	a	1,309.4	1,308.6	1,308.55	1,308.15	1,309.1
11	1,308.2	1,307.95	1,307.6	1,307.95	1,308.9	a	1,309.4	1,308.6	1,308.55	1,308.2	1,309.0
12	1,308.15	1,307.85	1,307.7	1,308.0	1,308.9	1,308.05	1,309.35	1,309.3	1,308.55	1,308.2	1,309.0
13	1,308.15	1,307.85	1,307.7	1,308.15	1,308.9	1,308.05	1,309.35	1,309.3	1,308.5	1,308.25	1,309.0
14	1,308.15	1,307.9	1,307.7	1,308.15	1,308.9	1,308.05	1,309.35	1,309.3	1,308.5	1,308.25	1,309.0
15	1,308.15	1,307.9	1,307.7	1,307.95	1,308.8	1,308.35	1,309.35	1,309.35	1,308.55	1,308.55	1,309.65
16	1,308.1	1,307.85	1,307.7	1,307.95	1,308.8	1,308.4	1,309.2	1,308.55	1,308.4	1,308.45	1,309.55
17	1,308.1	1,307.85	1,307.8	1,307.9	1,308.8	1,308.35	1,309.2	1,308.4	1,308.4	1,308.75	1,309.7
18	1,308.05	1,307.75	1,307.8	1,307.95	1,308.85	1,308.35	1,309.2	1,308.4	1,308.9	1,308.7	1,309.55
19	1,308.05	1,307.7	1,307.8	1,307.9	1,308.8	1,308.3	1,309.15	1,308.4	1,308.7	1,308.7	1,309.65
20	1,308.0	1,307.7	1,307.85	a	1,309.05	1,308.25	1,309.15	1,308.4	1,308.6	1,308.7	1,309.5
21	1,308.0	1,307.7	1,307.85	1,308.15	1,308.9	1,308.25	1,309.1	1,308.3	1,308.6	1,308.8	1,309.6
22	1,308.0	1,307.7	1,307.9	1,308.05	1,309.0	1,308.3	1,309.1	1,308.2	1,308.6	1,308.8	1,309.7
23	1,308.0	1,307.65	1,307.9	1,308.0	1,309.1	1,308.3	1,309.15	1,308.35	1,308.6	1,308.7	1,309.7
24	1,307.9	1,307.65	1,307.85	1,308.0	1,309.0	1,308.2	1,309.3	1,308.3	1,308.45	1,309.1	1,309.7
25	1,308.0	1,307.65	1,307.9	1,308.0	1,308.95	a	1,309.35	1,308.3	1,308.4	1,309.0	1,309.7
26	1,308.0	1,307.6	1,307.95	1,308.1	1,308.85	1,309.4	1,309.3	1,308.45	1,308.4	1,308.95	1,309.6
27	1,308.0	1,307.6	1,308.1	1,308.1	1,308.9	1,309.45	1,309.3	1,308.4	1,308.35	1,308.75	1,309.6
28	1,307.95	1,307.6	1,307.95	1,308.0	1,308.8	1,309.25	1,309.25	1,308.35	1,308.3	1,308.75	1,309.6
29	1,307.9	1,307.7	1,307.95	1,308.1	1,309.0	1,309.25	1,309.25	1,308.35	1,308.3	1,308.75	1,309.6
30	1,308.1	1,307.7	1,307.9	1,308.15	1,309.0	1,309.2	1,309.25	1,308.3	1,308.4	1,308.75	1,309.6
31	1,308.0	1,307.7	1,307.9	1,308.3	1,309.0	1,309.2	1,309.3	1,308.3	1,308.4	1,308.75	1,309.1

NOTE.— Station discontinued May 31, 1919. a No record.

CHADAKOIN RIVER AT WARNER DAM, JAMESTOWN

Gage No. 225

This station, established July 31, 1915, is located at Warner dam, Jamestown, about 4 miles below the foot of Chautauqua lake. The gage, No. 225, is a staff having a range of 16 feet, between elevations 1,304.0 and 1,320.0 (U. S. G. S. datum), secured to the second pile from the right bank of the river, about 30 feet upstream from the dam. The gage is read once daily to tenths, with occasional readings to half-tenths.

Daily elevation of water-surfaces (U. S. G. S. datum) of CHADAKOIN RIVER ABOVE WARNER DAM, JAMESTOWN, for the year ended June 30, 1919.
 Horace S. Butts, Observer

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
1.....	1,307.25	1,306.9	1,307.0	1,307.1	1,307.15	1,307.0	1,307.3	1,307.6	1,307.4	1,307.95	1,308.55
2.....	1,307.25	1,306.9	1,307.0	1,307.0	1,307.15	1,307.15	1,307.95	1,307.45	1,307.4	1,308.1	1,308.4
3.....	1,307.5	1,306.95	1,307.0	1,307.1	1,307.05	1,307.2	1,307.9	1,307.6	1,307.5	1,307.9	1,308.45
4.....	1,307.4	1,306.9	1,306.95	1,307.0	1,307.3	1,307.3	1,307.7	1,307.8	1,307.25	1,307.8	1,308.35
5.....	1,307.25	1,306.9	1,307.2	1,307.3	1,307.2	1,307.2	1,307.85	1,307.8	1,307.5	1,307.8	1,308.4
6.....	1,307.15	1,306.9	1,307.15	1,307.4	1,307.2	1,307.2	1,307.65	1,307.5	1,307.45	1,307.95	1,308.25
7.....	1,306.9	1,306.9	1,306.95	1,307.2	1,307.1	1,307.25	1,307.55	1,307.3	1,307.45	1,307.95	1,308.4
8.....	1,307.2	1,306.85	1,307.1	1,307.0	1,307.3	a	1,307.6	1,307.25	1,307.4	1,307.85	1,308.3
9.....	1,307.2	1,307.0	1,307.0	1,307.1	1,307.15	a	1,307.4	1,307.25	a	1,307.95	1,308.25
10.....	1,307.2	1,307.0	1,307.0	1,307.0	1,307.4	a	1,307.4	1,307.4	1,307.8	1,307.9	1,308.35
11.....	1,307.2	1,307.0	1,306.8	1,307.1	1,307.3	a	1,307.4	1,307.4	1,307.65	1,308.2	1,308.7
12.....	1,307.1	1,307.0	1,306.8	1,307.0	1,307.1	1,307.3	1,307.4	1,307.4	1,307.6	1,308.3	1,308.5
13.....	1,307.15	1,306.9	1,307.0	1,307.4	1,307.1	1,307.3	1,307.2	1,307.45	1,307.35	1,308.55	1,308.5
14.....	1,307.0	1,306.8	1,306.9	1,307.2	1,307.1	1,307.3	1,307.2	1,307.4	1,307.5	1,308.4	1,308.5
15.....	1,307.0	1,306.8	1,306.8	1,306.7	1,307.2	1,307.8	1,307.2	1,307.35	1,307.3	1,308.3	1,308.45
16.....	1,306.9	1,306.8	1,306.9	1,306.8	1,307.15	1,307.6	1,307.4	1,307.25	1,307.2	1,308.25	1,308.4
17.....	1,306.9	1,306.7	1,307.0	1,306.8	1,307.2	1,307.55	1,307.3	1,307.4	1,307.4	1,308.6	1,308.3
18.....	1,306.9	1,306.5	1,307.0	1,306.8	1,307.3	1,307.55	1,307.3	1,307.5	1,307.6	1,308.4	1,308.4
19.....	1,306.95	1,306.4	1,307.1	1,306.75	1,307.15	1,307.4	1,307.2	1,307.3	1,307.6	1,308.2	1,308.2
20.....	1,306.8	1,307.0	1,307.1	a	1,307.3	1,307.4	1,307.35	1,307.4	1,307.5	1,308.5	1,308.2
21.....	1,306.9	1,306.9	1,307.15	1,307.0	1,307.3	1,307.35	1,307.35	1,307.35	1,307.5	1,308.45	1,308.3
22.....	1,306.8	1,306.9	1,307.1	1,306.95	1,307.3	1,307.55	1,307.35	1,307.4	1,307.4	1,308.45	1,308.3
23.....	1,307.0	1,306.7	1,307.0	1,307.0	1,307.3	1,307.5	1,307.4	1,307.35	1,307.25	1,308.4	1,308.4
24.....	1,306.9	1,306.7	1,307.2	1,306.95	1,307.2	1,307.2	1,307.2	1,307.35	1,307.35	1,308.4	1,308.4
25.....	1,306.9	1,306.9	1,307.1	1,306.95	1,307.2	a	1,307.2	1,307.9	1,307.4	1,308.1	1,308.4
26.....	1,307.0	1,306.85	1,307.3	1,307.0	1,307.1	1,307.6	1,307.2	1,307.35	1,307.95	1,308.0	1,308.3
27.....	1,307.05	1,306.85	1,307.4	1,306.3	1,307.3	1,307.3	1,307.1	1,307.25	1,307.95	1,308.3	1,308.3
28.....	1,307.0	1,306.8	1,307.0	1,306.95	1,306.9	1,307.35	1,308.0	1,307.2	1,308.0	1,308.2	1,308.2
29.....	1,306.9	1,307.2	1,307.2	1,306.8	1,307.35	1,307.3	1,307.55	.....	1,307.8	1,308.4	1,308.2
30.....	1,307.1	1,307.1	1,307.1	1,306.8	1,307.3	1,307.2	1,307.7	.....	1,307.45	1,308.4	1,308.1
31.....	1,307.2	1,307.2	.....	1,306.7	.....	1,307.2	1,307.7	.....	1,307.75	.....	1,308.0

Norm.—Station discontinued May 31, 1919. a No record.

TABLE OF DISCHARGES PER SQUARE MILE
Summary of Discharge, in Second-foot per Square Mile, for all River Stations for which Data are Available in this Report

STATION	Drain- age area	1918						1919						Maintained by
		July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	
ST. LAWRENCE RIVER BASIN														
Cattaraugus creek at Versailles.....	Sq. mi. 467	0.388	0.229	0.540	0.934	1.280	1.580	1.580	1.030	1.980	2.610	3.550	0.906	U. S. G. S.
Little Tonawanda creek at Lunden.....	22	0.098	0.044	0.077	0.353	0.443	1.170	1.040	0.705	0.244	2.100	3.550	0.906	U. S. G. S.
Genesee river at St. Helena.....	208	0.384	0.357	1.020	0.802	1.850	1.090	1.150	0.622	1.690	2.830	5.350	0.882	U. S. G. S.
Genesee river at Jones bridge, Mt. Morris.....	992	0.142	0.171	0.505	0.578	1.130	1.300	1.010	0.407	1.520	2.420	4.600	0.741	U. S. G. S.
Genesee river at Rochester.....	1,400	0.152	0.157	0.437	0.470	0.956	0.992	0.900	0.411	1.410	2.390	4.680	0.743	U. S. G. S.
Genesee river at Rochester.....	2,360	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	U. S. G. S.
Canaseraga creek near Dansville.....	167	.....	.....	.....	.....	.....	.....	.....	.....	1.880	3.770	.....	.....	U. S. G. S.
Canaseraga creek at Cumminsville.....	180	0.204	0.154	0.213	0.215	0.341	0.388	0.532	0.244	1.320	2.100	3.550	0.919	U. S. G. S.
Canaseraga creek at Groveland Station.....	184	0.203	0.151	0.214	0.333	0.471	0.718	0.868	0.321	1.160	1.900	3.730	0.930	U. S. G. S.
Keshonqua creek at Craig Colony, Seneca.....	69	0.077	0.047	0.086	0.153	0.224	0.343	0.363	0.159	0.714	1.370	3.190	0.490	U. S. G. S.
Canadice lake near Hemlock.....	12.6	0.280	0.221	0.172	0.144	0.172	0.193	0.428	1.244	1.343	1.282	3.871	0.931	R. C. E.
Oswego river at Minetto.....	5,091	0.909	0.371	0.556	0.899	1.045	0.998	0.911	0.767	1.277	1.971	2.272	1.123	U. S. G. S.
Oswego river at new High dam.....	5,097	0.840	0.621	0.784	1.266	1.516	1.438	1.285	1.073	1.728	2.640	2.890	1.528	U. S. G. S.
Oswego outlet near Auburn a.....	206	0.908	0.893	0.699	0.660	0.723	0.995	1.440	0.922	1.420	3.120	2.890	0.947	U. S. G. S.
Oneida river at Caughdenoy.....	1,377	0.710	0.447	0.582	1.857	2.311	2.348	1.946	1.397	2.119	3.176	3.231	1.512	U. S. G. S.
Black river near Boonville b.....	1,851	0.160	0.633	1.290	1.840	2.240	2.450	1.920	1.259	3.570	5.060	2.890	0.529	U. S. G. S.
Black river at Black River.....	1,870	1.100	0.620	1.090	1.940	2.560	2.110	1.840	0.920	3.350	5.730	3.220	0.908	U. S. G. S.
Moore river at Moore River.....	370	1.390	0.581	1.940	3.000	2.610	1.890	1.840	1.270	4.240	4.270	1.047	0.736	U. S. G. S.
Middle branch of Moose river at Old Forge c.....	51.5	1.700	1.400	1.960	3.000	2.920	1.920	1.140	1.210	2.450	4.270	1.047	0.736	U. S. G. S.
Beaver river at State dam near Beaver River d.....	176	1.350	1.350	1.900	1.380	2.070	2.370	1.700	1.600	2.390	5.010	3.140	1.320	U. S. G. S.
Oswegatchie river near Henrievton.....	961	0.679	0.522	0.922	2.500	2.910	2.970	1.900	1.120	3.530	4.650	2.920	1.390	U. S. G. S.
East branch of Oswegatchie river at Newton Falls.....	166	1.490	1.960	2.040	2.400	2.300	2.750	2.460	1.890	1.980	5.410	3.230	1.770	U. S. G. S.
West branch of Oswegatchie river near Harrisville.....	245	0.910	0.429	1.230	3.000	3.750	3.160	1.670	1.060	3.780	5.020	2.790	0.980	U. S. G. S.
Raquette river at Pierrefield e.....	723	1.550	0.874	0.697	2.730	3.170	2.090	1.600	0.896	1.670	5.340	3.980	1.430	U. S. G. S.
St. Regis river at Brasher Center.....	621	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	U. S. G. S.
Ansable river at Ansable Forks.....	444	0.806	1.380	1.800	3.660	2.550	2.160	1.900	0.689	3.060	4.120	2.780	1.020	U. S. G. S.
Saratoga river near Plattsburg.....	607	1.010	0.878	1.310	2.640	2.540	1.880	1.390	0.931	2.380	3.330	2.730	1.290	U. S. G. S.
Hudson River Basin														
Hudson river near Indian Lake.....	418	0.976	0.462	1.280	2.800	2.730	2.160	1.060	0.577	1.710	6.240	5.070	1.190	U. S. G. S.
Hudson river at North Creek.....	804	0.950	1.130	1.280	2.000	2.090	1.390	1.270	1.430	2.510	5.830	4.100	1.100	U. S. G. S.
Hudson river at Thurman.....	1,550	0.748	0.987	1.640	2.140	2.140	1.430	1.390	1.100	2.550	4.760	3.580	1.210	U. S. G. S.
Hudson river at Spier Falls.....	2,800	0.661	0.518	0.825	1.280	2.300	1.530	1.390	0.904	3.390	5.210	2.890	1.090	U. S. G. S.
Hudson river at Mechanicville, upper dam.....	4,500	0.513	0.327	0.666	1.100	1.900	1.810	1.450	0.762	2.440	3.430	2.930	0.907	W. V. P. & P. C.

Indian river at Mechanicville, lower dam.....	4,570	0.655	0.425	0.737	1.239	2.086	1.826	1.694	0.952	3.253	4.589	3.364	1.101	A. E. P. C.
Indian river near Indian Lake.....	132	1.360	5.100	2.420	0.018	0.050	0.183	1.950	5.670	0.818	1.950	4.680	0.871	U. S. G. S.
Schoon river at Riverbank.....	534	0.410	0.311	0.492	1.220	2.380	1.600	1.890	0.896	2.280	5.190	3.240	1.190	U. S. G. S.
Sacandaga river near Hope.....	494	0.476	0.160	0.494	1.210	2.410	1.310	1.890	0.890	5.950	6.840	4.430	0.940	U. S. G. S.
Sacandaga river at Hadley.....	1,060	0.558	0.189	0.708	1.220	2.420	2.330	1.650	0.728	4.160	5.260	3.400	0.836	U. S. G. S.
Hoesie river near Eagle Bridge.....	512	0.459	0.236	0.844	1.090	1.490	2.210	2.050	0.973	3.730	3.340	3.400	0.766	U. S. G. S.
Hoesie river at Schaghticoke.....	635	0.362	0.146	0.509	0.898	1.107	1.106	1.310	0.620	2.685	2.592	4.985	0.676	P. C.
Mohawk river at Vasher Ferry dam.....	3,400	0.723	0.429	0.896	1.360	1.490	1.990	1.400	0.874	2.790	3.200	2.490	0.595	U. S. G. S.
Mohawk river at Crescent dam.....	3,490	0.716	0.395	0.897	1.240	1.450	1.930	1.400	0.817	2.810	3.270	2.540	0.545	U. S. G. S.
Schoharie creek at Prattsville.....	236	0.290	0.080	0.690	0.770	0.780	1.530	1.590	0.920	3.260	4.410	3.690	0.720	B. W. S.
Esopus creek at Coldbrook.....	192	0.450	0.170	0.690	0.700	0.970	1.430	1.830	0.960	4.860	4.490	4.690	1.030	B. W. S.
Rondout creek at Lackawack.....	100	0.490	0.220	1.030	1.230	1.430	2.160	2.450	1.350	4.130	3.380	3.290	1.040	B. W. S.
Rondout creek at Rosendale.....	336	0.390	0.160	0.600	0.650	0.990	2.630	2.120	.....	.....	.....	.....	.....	B. W. S.
DELAWARE BASIN														
East branch of Delaware river at Fish Eddy.....	790	0.456	0.238	0.620	1.560	0.980	2.250	2.270	0.851	3.250	4.080	3.110	0.737	U. S. G. S.
Delaware river at Port Jervis.....	3,250	0.422	0.194	0.505	1.030	1.000	1.600	1.640	0.788	2.860	2.790	2.380	0.692	U. S. G. S.
Beaver kill at Cooks Falls.....	236	0.521	0.280	0.631	1.480	1.380	2.770	2.350	0.911	4.120	4.140	3.050	0.983	U. S. G. S.
West branch of Delaware river at Hale Eddy.....	611	0.599	0.172	1.010	1.920	1.630	1.700	1.870	0.910	2.860	3.130	2.270	0.386	U. S. G. S.
SUSQUEHANNA RIVER BASIN														
Susquehanna river at Conklin.....	2,350	0.506	0.238	0.744	1.360	1.750	1.760	1.750	0.834	2.450	2.630	2.210	0.451	U. S. G. S.
Chenango river near Chenango Falls.....	1,420	0.841	0.296	0.870	1.160	1.900	2.010	1.650	0.866	2.780	2.980	2.680	0.479	U. S. G. S.
Chenango river at Chemung.....	2,440	0.156	0.114	0.382	0.683	0.766	0.668	0.701	0.321	1.530	1.990	4.710	0.619	U. S. G. S.
Toga river near Erwins.....	1,320	.....	0.130	0.495	0.655	0.909	0.765	0.758	0.377	1.600	1.950	5.330	0.644	U. S. G. S.
Colchester river near Savona.....	383	.....	.....	.....	.....	.....	.....	.....	.....	1.320	2.030	4.570	0.862	U. S. G. S.
Colchester river near Campbell.....	480	.....	0.176	0.392	0.379	0.788	0.808	0.750	0.494	1.320	1.970	4.310	0.877	U. S. G. S.
Mud creek at Savona.....	80	.....	0.218	0.261	0.209	0.388	0.451	0.440	0.335	0.886	1.340	2.950	0.781	U. S. G. S.
ALLEGHENY RIVER BASIN														
Allegheny river at Red House.....	1,640	0.337	0.426	1.130	1.290	2.150	1.770	1.560	0.708	2.160	2.790	5.100	0.768	U. S. G. S.
West branch of Ausable river near Newman.....	116	1.410	0.478	0.659	0.831	1.010	1.210	.....	.....	1917	.....	2.250	2.600	U. S. G. S.
Beaver kill at Cooks Falls.....	236	.....	.....	.....	.....	.....	.....	.....	.....	1918	.....	.....	.....	U. S. G. S.

^a An average flow of about 10 second-feet is pumped from Owaseo lake for water-supply of city of Auburn. Proportion returning to stream above gaging station not known. ^b These figures do not include the total run-off above this station on account of diversion through Forestport feeder into Black River canal. ^c These figures indicate the flow of the river as regulated at Old Forge dam. ^d These figures indicate the flow of Beaver river, as regulated by the sluice-gates and logway at the dam. ^e These figures are not corrected for storage. ^f These figures indicate the flow of Indian river as regulated by the sluice-gates and logways at Indian Lake dam. ^g U. S. G. S.—United States Geological Survey. ^h R. C. E.—Rochester City Engineer. ⁱ S. E.—Department of New York State Engineer. ^j W. Va. P. & P. C.—West Virginia Fuel and Paper Co. ^k A. E. P. C.—Adirondack Electric Power Corporation. ^l S. P. C.—Schenectady Power Company. ^m B. W. S.—New York City Board of Water Supply.

CLIMATOLOGICAL DATA

On the following pages there are published certain records of precipitation at stations throughout the State maintained either by the Department of the State Engineer, by the United States Weather Bureau in coöperation with the Department of the State Engineer, by the Board of Water Supply of New York city, by the Department of the State Engineer in coöperation with the United States Geological Survey or by private corporations or individuals. In connection with each record acknowledgment is made when due.

These records are published under the general headings of St. Lawrence River Drainage Basin and Hudson River Drainage Basin. Under these general heads are grouped the stations on the watersheds of the various streams of the two large drainage basins. The order of arrangement is similar to that of the stream gaging stations.

Stations maintained by the Board of Water Supply are located in territory adjacent to present or possible future sources of water-supply for New York city and are given under the headings "Catskill Watersheds," and "Watersheds at Large," and show monthly totals only.

The precipitation given under any date is the amount occurring during the twenty-four hours ending at 8 A. M. of that date. Precipitation records here given are not intended to embrace all data available, but only such data collected wholly or in part by the State of New York or that is available through the efforts of others than the United States Weather Bureau, whose publications should be consulted in connection with any study made of rainfall or run-off.

ST. LAWRENCE RIVER DRAINAGE BASIN

LITTLE TONAWANDA CREEK WATERSHED

Daily precipitation, in inches, at LINDEN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.			0.38		0.07	0.34		†0.04	0.45	*0.10	0.15	
2.					0.02		0.15				0.05	
3.						0.02	†0.19					
4.					0.19	0.12				0.09	0.09	
5.		0.10	0.35		0.06	0.16				0.03	0.44	0.46
6.			0.60	0.64		0.32			0.28			0.5
7.				0.45						0.20	0.07	0.53
8.					0.02		†0.05	†0.09		0.10		0.39
9.		0.80					†0.10	†0.11	0.42	0.35	0.14	0.61
10.			0.02		0.09		†0.09	†0.03	0.18	0.22	0.50	
11.						0.26				0.18	0.11	
12.		0.06	0.04	0.14		0.02			0.10	0.38	0.15	
13.			0.70	0.05	0.01	0.05				0.06	0.07	
14.			0.06	0.13		0.16		0.17				
15.		0.01		0.06		0.16		0.18				
16.			0.31					†0.13	0.46	0.48		
17.			0.76		0.02			0.32	0.05	0.41	0.22	
18.				T	0.16			†0.16	0.15	0.07	0.04	
19.			0.17		0.27							
20.			0.62	0.27	0.05							
21.				0.37	0.10			†0.14			0.12	0.19
22.		0.99			T	0.16		†0.10			0.11	
23.					0.03		0.04	0.11			0.05	
24.			0.45				0.23	0.11		0.48	0.11	
25.		0.05				0.59				*0.14		
26.			0.33	0.22	T			†0.12		0.22		0.47
27.				T								0.17
28.			T						0.35			
29.		0.30	0.03	0.18	0.18					0.21		
30.			0.09	0.02	0.04		†0.06					
31.		0.02		0.47		0.13						

† Melted snow.

* Snow.

T means trace.

NOTE.— Rain gage established August 1, 1918; maintained by State Engineer in cooperation with United States Geological Survey.

OAK ORCHARD CREEK WATERSHED

Daily precipitation, in inches, at MEDINA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	DAY	July	Aug.	Sept.	Oct.	Nov.
1.	0.23					16.			0.40		
2.				0.30		17.					0.38
3.					0.54	18.			0.10		0.70
4.					0.14	19.			0.64		
5.			1.27			20.				0.54	0.18
6.				0.20		21.		0.35			
7.		0.10				22.					
8.						23.			0.62		
9.	0.23	0.43			0.19	24.		0.35			
10.						25.				0.70	
11.			0.04			26.			0.14		
12.			0.41	0.20		27.					
13.			0.05			28.				0.31	0.15
14.				0.50		29.	0.47	0.22			
15.			0.04			30.	0.52			0.50	
						31.		0.44			

NOTE.— Maintained by State Engineer in cooperation with United States Geological Survey.

Daily precipitation, in inches, at CLYDE, for the year ended June 30, 1919

* Snow. ‡ 2.50 snow; 0.40 rain. T means trace.

[illegible]

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 415

Daily precipitation, in inches, at MAYS POINT, for the year ended June 30, 1919—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21			0.04	0.68	0.10					0.04	0.50	
22			0.08			0.20		†0.20			0.05	
23			0.44			0.23		0.12			1.15	
24							0.30	0.02		0.78	0.18	
25	0.92	0.11		0.15		0.29				*T	0.18	0.23
26				0.96		0.10		0.23		†0.11		1.52
27		0.06	0.22									
28	1.47		0.01						‡6.55			
29		0.28		0.03			0.03			0.26		
30	0.80		0.07		0.04		*2.00					
31		0.14		0.61			*2.50					

* Snow.

† Melted snow.

‡ Rain and snow.

T means trace.

GANARGUA CREEK WATERSHED

Daily precipitation, in inches, at MACEDON, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.44		0.28			*0.50	0.11	*T	0.28	*1.00	0.13	
2				0.06	0.04		0.05				0.38	
3		0.20		0.30	0.03	*T	*3.50					
4	0.37		0.02	0.01	0.28	0.08				0.15	0.07	
5		0.12	0.20	0.02	0.01	*0.62	*T	0.13		0.03	0.28	
6			0.57	0.66		*4.50	*T		‡2.51		0.05	
7		0.30		0.30		*1.25				0.18	0.10	0.03
8	0.04	0.24						*T		0.11		0.18
9	0.10	0.67			0.04		*T	*2.75	0.47	0.42	0.08	1.15
10	0.43				T		*3.00	*3.50	0.20	0.23	0.52	
11						0.20				0.33	0.95	
12		0.02	0.15	0.15		0.13				0.87	0.40	
13			0.35	0.05	0.01					0.01	0.17	
14	0.03			0.07		0.16		0.29		0.05		
15				0.45		0.12		0.11				
16	0.32		0.17			0.01	*0.75	‡1.37	0.20	0.15	0.02	
17	T		0.67		0.01				0.37	0.09	0.47	1.05
18			0.03	0.07	0.52			*0.75	0.02	0.01	0.01	
19			0.10		0.14			*0.75				
20			0.65	0.05	0.04			*T	T			
21				0.62	0.08			*0.38		0.09	1.22	0.12
22			0.04		0.12	0.20		*1.75	0.01		0.23	
23					0.01	0.06	0.01	0.06		0.01	0.63	
24	0.01		0.42				0.20			0.60	0.57	
25	0.02	0.01		0.02		0.40				‡2.03	0.04	
26				0.37	0.01	0.03		0.08		*2.25		0.50
27		0.19	0.10	0.01		*T			0.03			0.37
28	0.30		T			*0.38			‡4.20			
29	0.13	0.18	0.02	0.23	0.01	*T	T			0.17		
30	0.70	0.02	0.05	0.05		*T						
31		0.06		0.41		*0.31	*0.75					

* Snow.

‡ Rain and snow.

T means trace.

Daily precipitation, in inches, at NEWARK, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.35		0.45			*0.38	0.10		0.30	†0.03	0.15	
2.....				0.08			0.07				0.49	
3.....		0.12		0.22	0.07		*2.50					
4.....	0.37		T		0.31	0.10				0.09	0.02	
5.....		0.13	0.05			0.01		0.08		0.03	0.29	
6.....			0.45	0.65		*5.50			*1.75		T	T
7.....		0.04		0.25		*T				0.25	0.08	0.05
8.....		0.27								0.03	0.02	
9.....	0.07	0.64			0.01			*0.25	0.36	0.43	0.14	1.34
10.....	0.20		T				†0.03	*1.50	0.23	0.35	0.56	0.03
11.....	0.21					0.11				0.29	1.10	
12.....	0.20	0.01	0.21	0.11		0.14				0.97	0.07	
13.....			0.34								0.27	
14.....				0.15	0.09	0.04		0.25		0.02		
15.....				0.24		0.18		0.06				
16.....			0.21				*T	0.16	0.03	0.09		
17.....	0.62		0.57		T				0.48	0.08	0.38	0.50
18.....			T	0.05	0.62			*0.50	0.06	T	0.12	
19.....			0.34		0.10							
20.....			0.69		0.12							T
21.....			0.01	0.77	0.08			*T		0.09	0.95	0.11
22.....			0.07		0.05	0.28		*0.50			0.31	
23.....						0.09		0.05			0.43	
24.....			0.45							0.82	0.45	
25.....	0.08			0.09		0.15				0.02	0.15	
26.....				0.39					0.12	*1.66		0.41
27.....												1.57
28.....		0.06	0.16			*T		*0.50				
29.....	0.05	0.12	0.02	0.14	0.05		†0.01		0.35	0.21		
30.....	0.22	0.01	0.05	0.08			*0.50					
31.....		0.07		0.43		0.01	†0.02					

*Snow.

† Melted snow.

T means trace.

SENECA RIVER WATERSHED

Daily precipitation, in inches, at BALDWINVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.25				0.06							
2.....		T			0.45		*0.21				1.20	
3.....	0.12					*0.12						
4.....		0.05		0.32	0.20					0.08		
5.....			0.35		T					0.04	0.15	
6.....						*0.29						
7.....											0.08	
8.....		1.16										
9.....	0.18		T		0.08				*0.50	0.06	0.58	
10.....							*0.50		*0.65	0.47	0.85	0.30
11.....						*0.40				0.82	0.40	
12.....			0.18	0.43							0.10	
13.....			0.26	0.32		*0.28		*0.84				
14.....				0.28	0.06							
15.....						*0.26						
16.....									*0.75	0.49		0.60
17.....	0.60		0.05		1.20						0.95	
18.....			0.65		0.12							
19.....			0.62		T							0.20
20.....			0.08	0.58	0.10					0.12	0.70	

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 417

Daily precipitation, in inches, at BALDWINVILLE, for the year ended June 30, 1919

—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.					0.40	*0.27		*0.26			0.18	
22.			T		0.08					0.74	1.10	..
23.						*0.20	*0.80				0.10	
24.			0.65		0.09	*0.28					0.20	
25.												
26.		T		0.08								0.60
27.	0.70		0.21									
28.		0.25	0.06		0.06			*0.55	*0.48	0.33		
29.	0.65			0.10		*0.21						
30.		T		0.68	0.05							
31.		0.34		T								

* Snow. T means trace.

ONEIDA RIVER WATERSHED

Daily precipitation, in inches, at LOCK No. 22, NEAR NEW LONDON, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		0.02		0.02			0.10		0.22			
2.					0.14						2.00	
3.			0.03	0.46	0.20	*0.38					0.03	
4.		0.15		0.01	0.19	*0.62				0.06	0.04	
5.					0.08	*0.38		0.10			0.04	
6.		0.07	1.18	0.55		*4.00	*4.00	†0.01	0.18			0.30
7.		0.50		0.05						0.03	0.25	
8.										0.48		0.09
9.		1.24					*2.25		0.10	0.38	0.01	0.04
10.		0.14			0.21				0.57	0.21	0.11	
11.			0.03				*0.75		0.00	0.47	0.85	
12.			0.60			*0.50				0.64	0.39	
13.		0.05	0.90	0.01						0.04		
14.			0.05	0.12	0.07	0.39		0.02				
15.				0.07		0.21		0.45				
16.			0.09						0.09			1.30
17.			1.20						0.46	0.43	0.52	0.18
18.			0.04		0.60					0.10	0.77	
19.			0.52		0.45				0.11			0.07
20.			0.65								0.36	0.48
21.		0.66	0.25	1.38	0.02					0.23		
22.			0.15		0.04	0.88		†0.03			0.49	
23.			0.04				0.55				0.33	
24.		0.03	0.52			‡0.56				0.54	0.18	
25.			0.02			‡0.29				0.08	0.17	0.57
26.			0.05	1.55		*0.50		0.60				0.22
27.			0.17	0.01						0.02	0.07	0.68
28.			0.02						0.45			
29.		0.63	0.07	0.02	0.17	*2.00	*1.76			0.20		
30.			0.02	0.30	0.02							
31.		0.41		0.87		*1.00						

* Snow. ‡ Rain and snow. † Melted snow.

BLACK RIVER WATERSHED

Daily precipitation, in inches, at BOONVILLE, for the year ended June 30, 1919

DAY	July	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.76					*1.10	0.27		0.82		0.05	
2				0.06			0.38				0.95	
3			0.11	0.32			*0.46					
4						*0.22	*0.31			0.20	0.35	
5		0.12	0.64							0.12		
6			0.50	0.88		*0.55		*0.72	*0.14			0.10
7		0.07						*0.78		0.10	0.33	
8		0.13				0.06	*0.41					
9	0.15	0.81					*0.31		0.32	0.55		
10							*0.24		0.94		0.13	
11	0.18						*0.23		*0.33	0.60	0.65	
12	1.79		0.93							1.13		
13	0.39		1.01	0.25						0.08	0.27	
14	0.52	0.22		0.07		0.74		1.03		0.17		
15	0.11			0.04		0.31						0.13
16			0.28						0.07			0.15
17	0.66		2.00						0.14	0.25	1.40	
18			0.78						0.60	0.10	0.49	
19			0.02									
20			0.70	0.91								0.25
21				0.21						0.10	0.42	0.14
22			0.70			0.34		*0.75			0.10	
23			0.33			0.92		*0.35			0.41	
24			0.31				*1.07	*0.26		0.80	0.34	
25				0.29		1.02					0.57	
26			0.39	0.82				†0.80		*0.05		0.60
27			0.12					*0.32	1.00			0.73
28												
29		0.53	0.10							0.20		
30	0.76		0.03	0.45		*0.18			*0.12			
31		1.24		0.68			*0.12		1.00			

* Snow. † Snow 0.41; rain 0.39.

WOOD CREEK WATERSHED

Daily precipitation, in inches, at SMITH'S BASIN, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.05		2.10	0.10			‡0.55		0.55			
2	0.26				0.03		0.29				0.82	
3	0.02	0.05		0.14		*0.25	*4.00				0.01	
4				0.01	0.01	*1.00				0.10	0.02	
5					0.25	*0.50				0.03	0.9	
6	0.07		0.22	0.63		*2.00			0.10			
7	1.21	0.16				*0.12						0.40
8	0.07						*1.50				0.43	0.02
9		0.97	0.50		0.02				0.53	0.20	0.05	0.35
10	0.51	0.35			0.04		*0.75		0.82			1.11
11	0.36	0.08								0.26	0.14	
12			0.08			*1.50			*0.25	0.72	0.01	
13	0.01			0.04							0.07	
14	0.14		0.72	0.08		0.26		0.22				
15	0.02	0.82		0.08		0.15		0.44				0.06
16	0.01		0.06					*0.12	0.24	0.07		0.34
17	0.65		0.30						0.42	0.57	0.54	
18	0.09		0.06		0.55				0.12	0.04	0.50	
19			0.44		2.17				0.06	0.02		
20			0.19		0.03				0.01			

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 419

Daily precipitation, in inches, at SMITH'S BASIN, for the year ended June 30, 1919—

Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21			0.82	0.35	0.03						0.03	
22								*2.00			1.06	
23						0.78		*3.25			0.14	
24			0.28				1.16				0.07	
25		0.07	0.02			*1.45				0.25	0.16	
26			1.44	0.36		0.03		*3.75			0.33	
27			0.95	0.04		*0.25						0.08
28			0.01	0.01		*0.12			*2.02			0.28
29		0.20			0.44		*0.75		*2.00	0.16		
30	0.16	0.02		0.22	0.01							
31				0.83		*0.50			*0.25			

* Snow. §* Rain and snow.

Daily precipitation, in inches, at WHITEHALL, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.11		1.35						0.57			
2	0.02								0.05		0.74	
3		0.05		0.30							T	
4										0.03		
5			0.01	0.60						0.06	0.51	
6	0.06		0.17	0.30					T		0.01	
7			0.03						*T			0.27
8	0.18								*T		0.32	0.09
9	0.01	1.13	0.05						0.15	0.18	0.04	0.22
10	0.20								1.09		0.03	0.70
11	0.05									0.27	0.11	
12	0.01	0.30	0.05						0.02	0.97	0.03	
13	0.04		0.27							T	0.02	
14	0.09		0.26	0.25								
15	0.01	0.31										0.20
16			0.03						0.09	0.04		0.84
17	0.33		0.43						0.36	0.48	0.51	0.07
18	0.04		0.05	0.07					0.14	0.08	0.78	
19			0.46						T		T	
20	0.15		0.22									
21			0.72	0.34								0.04
22			0.03								1.45	
23											0.34	
24		0.02									T	T
25										0.11	0.17	
26		0.02		0.27						*0.50	0.14	T
27				0.03								1.24
28									1.15			0.39
29	0.58	0.11							*5.45	0.18		
30	0.15			0.46					*T	0.01		
31				1.00					*0.50			

* Snow. §* Rain and snow. T means trace.

NOTE.—No records, September 23 to 30 and November 1 to February 28.

HUDSON RIVER DRAINAGE BASIN

HUDSON RIVER WATERSHED

Daily precipitation, in inches, at CORINTH, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1				0.6			0.32		0.35			
2	0.42		1.40				0.25				1.11	
3				0.12			*0.38					
4					0.35	*0.25						
5											0.33	
6			0.22	0.42		*0.40			*0.30			
7	0.06		0.15									
8	0.68						*0.22				0.40	
9		0.66	0.05						0.40	0.40	0.08	
10	0.40	0.35			0.12				1.00			
11		0.20								0.32	0.28	
12			0.15			*0.22				0.92	0.08	
13	0.20		0.45								0.30	
14			0.25	0.15		0.22		*0.20				
15	0.18	0.07	0.06			0.15		0.60				
16									*0.12			
17			0.45						0.48	0.82	0.60	
18	0.30				0.82				0.14		0.20	
19			0.55		0.85							
20			0.15									
21			0.75	0.72	0.30							
22								*0.35			1.00	
23						0.82		*0.62			0.82	
24							0.98				0.18	
25			0.16			0.91				0.55	0.30	
26			1.35	0.25				*0.92				
27			1.25			*0.03						
28									*1.60			
29		0.85		0.35	0.40		*0.05		*0.20	0.12		
30	0.18			0.35								
31				1.12								

* Snow.

NOTE.— Station maintained by U. S. Weather Bureau in cooperation with the State Engineer.
No record for June.

Daily precipitation, in inches, at GLEWS FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1			1.46				0.14		0.41		0.93	
2	0.22						0.40					
3				0.22			*0.46				0.03	
4						*0.25	*0.12			0.06	0.23	
5			0.25		0.34							
6			0.02	0.55		*0.37			0.37			
7	0.30										0.34	0.42
8	0.26											0.13
9		0.75	0.06		0.06		0.06		0.15	0.27	0.06	0.43
10	0.34	0.16			0.11				1.40		0.03	0.66
11		0.09								0.22	0.25	
12			0.16			*0.23			0.03	0.92	0.03	
13			0.32									
14	0.63		0.36	0.19		0.25						
15	0.78					0.08		*0.92				0.21

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 421

Daily precipitation, in inches, at GLENS FALLS, for the year ended June 30, 1919—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.			0.09							0.12	0.53	0.39
17.	0.82		0.15						0.55	0.70	0.35	
18.	0.20		0.05		0.60					0.02		
19.			0.50		1.22							
20.			0.10								0.08	
21.			0.69	0.42	0.11						1.05	
22.								*0.23			0.43	
23.						0.70					0.04	
24.			0.20				1.01	*0.60			0.20	
25.			0.11			*0.97				0.32	0.06	0.16
26.			1.74	0.09		0.03		*0.75				
27.			0.77	0.24								0.29
28.												0.17
29.		0.28			0.41	0.03	*0.06		*1.56	0.13		
30.		0.21		0.22								
31.				0.87								

* Snow.

NOTE.—Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer.

Daily precipitation, in inches, at SCHUYLERVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	0.58		0.22				0.66		0.68		0.60	
2.	0.01					*0.38					0.28	
3.						*5.00					0.01	
4.					0.45	*0.25	*2.50			0.04	0.73	
5.		0.10			T	*2.00						
6.	0.17		0.12						0.10			0.44
7.	0.21	0.02			0.02					0.08	0.59	
8.	0.01		0.05			0.01	*1.00				T	
9.	0.26	0.74			0.18				1.15	0.17	0.13	1.45
10.	0.09	0.04			0.02		*0.75			0.09	0.20	
11.	0.62	0.09				*0.50						
12.	0.01		0.07							0.85	0.04	
13.	0.24		0.61			0.32				0.01		
14.	0.11	0.02				0.13		*1.08				0.01
15.												0.40
16.			0.07						0.57			
17.	0.35		0.23		0.40					0.64	1.00	
18.			0.58		1.30				0.20		T	
19.	0.01				0.01							
20.			0.70		0.04							0.01
21.			0.36		0.10			*3.25		0.01	0.60	
22.					0.01	1.07					0.94	
23.			0.01				1.30	*1.25			0.05	T
24.		0.25	0.38							0.38	0.07	
25.		0.14	0.02			0.83					0.48	
26.			2.70					0.82		*0.38		0.06
27.			0.01			*0.12						0.18
28.	0.02				0.20				0.77			T
29.		0.62			0.08	*0.12	*0.38		*5.50			
30.	0.40				T				*0.50			
31.		1.00	0.17			*0.62			*2.00			

* Snow. ** Rain and snow. T means trace.

NOTE.—Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer.

[illegible]

* Snow.
NOTE.—Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer.

[illegible]

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 423

Daily precipitation, in inches, at TROY, for the year ended June 30, 1919—*Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....			0.26								0.73	.....
22.....			0.03								0.81	.....
23.....						0.42					0.05	.....
24.....		0.12	0.26							0.18	0.12	.....
25.....						0.59				0.04	0.02	.....
26.....		0.86	1.45			0.07						.....
27.....			0.74						1.78			0.31
28.....									0.27	0.02		.....
29.....		0.32								0.01		.....
30.....		0.01							0.07			.....
31.....		1.95							0.02			.....

NOTE.—Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer. No record for July, October, November, January and February.

SACANDAGA RIVER WATERSHED

Daily precipitation, in inches, at NORTHVILLE, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....			1.37			*0.12	*0.30					
2.....	0.62						0.38					
3.....				0.32		*0.06	*0.30					
4.....						*0.25	*0.10					
5.....		0.08			0.06					0.12		
6.....	0.12		0.52	0.51		*0.36			0.29			
7.....	0.19											
8.....							*0.18					
9.....		1.10					*0.04		0.57	0.28		
10.....	0.25				0.18				1.0			
11.....		0.24								0.49		
12.....			0.14			*0.22				0.80		
13.....	0.28		0.20									
14.....	0.75			0.08		0.29		0.22				
15.....		0.45	0.36			0.11		*1.05				
16.....			0.03							0.10		
17.....			0.43						0.65	0.45		
18.....	0.38				0.99				0.19			
19.....			0.51		0.52							
20.....	0.18		0.15						0.14			
21.....			0.53	1.11								
22.....						0.14		*0.30				
23.....						1.06		*0.48				
24.....			0.17				0.75			0.18		
25.....	0.10		0.05			1.10				0.31		
26.....			1.34	0.21				*0.90				
27.....			0.94	0.06								
28.....						0.04			*1.26			
29.....		0.38			0.32	0.03	*0.10		*0.10	0.21		
30.....	0.08			0.53	0.05							
31.....				1.51								

*Snow.

NOTE.—Station maintained by U. S. Weather Bureau in cooperation with the State Engineer. No record for May and June.

HOOSICK RIVER WATERSHED

Daily precipitation, in inches, at HOOSICK FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1							0.09		0.68			
2				0.19		*0.06	0.53		0.69		0.53	
3				0.21			*0.68					
4					0.40		*0.04			0.13	0.05	
5					0.28	*0.03	*0.03			0.02	0.63	
6				0.22		*0.25			0.10		0.01	
7				0.08		*0.02						0.04
8										0.11	0.36	
9						*0.12	*0.02		0.06	0.16	0.06	0.01
10					0.10		*0.12		0.39		0.04	0.60
11										0.15	0.20	
12										0.86	0.2	
13				0.13						0.04	0.11	
14				0.20		0.56				0.01		0.04
15												0.18
16								*0.34	0.03			0.05
17								0.14	0.23		0.15	
18					0.28			0.04	0.02		0.90	0.01
19					0.80			0.11	0.01		0.02	
20					0.02							
21				0.22	0.08							0.02
22								*0.22			0.75	
23						0.38		*0.11			0.10	
24							0.56	0.02			0.06	
25						0.40		0.02		0.15	0.12	
26				0.12		0.12		0.68		*0.02	0.21	
27				0.18						0.03	0.02	0.40
28									1.54			0.32
29									0.73	0.01		
30				0.11					0.03	0.01		
31				0.43								

* Snow.

NOTE.— Station maintained by the U. S. Weather Bureau in coöperation with the State Engineer. No record for July, August and September.

MOHAWK RIVER WATERSHED

Daily precipitation, in inches, at DELTA DAM, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.55		0.79	0.06		†0.20	0.15		0.34			
2				0.04	0.31		0.25				1.47	
3		0.03		0.31	0.09	†0.02	†0.35				0.01	
4	0.28		0.07		0.20	†0.20	†0.10			0.07	0.03	
5		0.10	0.19		0.15		†0.05	†0.12		0.02	0.19	
6			1.35	0.61		†0.30		†0.02	†0.35			0.13
7	0.02	0.52						†0.07		0.16	0.24	
8		0.11					†0.21			0.12	0.06	
9	0.16	1.33					†0.15	†	0.29	0.42	0.05	
10	0.38	T			0.25		†0.04		0.69	0.20		
11	0.33	0.04			0.03	0.38			†0.17	0.43	0.93	
12			0.68							0.84	0.11	
13			1.12	T						0.06	†.24	
14	0.14		0.15	0.16	0.08	†0.34		0.47		0.01		
15	0.13			0.07		†0.26		0.23				

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 425

Daily precipitation, in inches, at DELTA DAM, for the year ended June 30, 1919—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.			0.17					†T	0.07			
17.	0.15		1.12		0.02				0.49	0.31	1.52	0.02
18.	0.16		0.05		0.78				0.16	0.04	0.70	0.11
19.			0.37		0.29		†T				0.01	
20.			0.55		0.04				0.01			0.07
21.			0.08	1.08	0.02					0.14	0.10	
22.		0.11	0.11			0.27		†0.11				
23.						0.45		†0.29			0.38	
24.	0.06		0.40				0.37				0.67	0.32
25.	0.11					0.44	†T				0.08	0.14
26.			0.16	1.24		0.16		0.96		†0.04	0.27	1.18
27.		T	0.34	0.03		*T		†0.02				0.63
28.						*T	†0.04		0.65			
29.		0.56	0.07	0.04	0.24		†0.06			0.20		
30.	0.41		0.03	0.44	0.14	†0.07						
31.				0.84		†0.06	†T		†0.01			

* Snow. † Melted snow. T means trace.

NOTE.— Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer

Daily precipitation, in inches, at ADRIAN RESERVOIR, NEAR UTICA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	0.83		0.92	0.09	0.03	*0.03	0.21	*0.02	0.35		0.43	
2.	0.40						0.38				0.03	
3.	0.08	0.06		0.56	0.16	*0.02	*0.45					
4.	0.27		0.02		0.05	0.12	*0.11			0.07	0.30	
5.		1.02		0.42	0.18	*0.14	*0.04	0.08		0.08	0.06	
6.			0.84	0.07		*0.10		*0.02	*0.38		0.02	0.21
7.		0.18				*0.02		*0.02		0.18	0.46	0.03
8.		0.40					*0.02			0.10	0.14	
9.	0.12	0.40					*0.01		0.04	0.32	0.12	0.02
10.	0.27	0.48			0.22		*0.11		*1.10	0.20	0.94	0.05
11.	0.08	0.11				*0.05			0.11	0.43	0.14	
12.	0.02		0.15			0.33				0.78	0.18	
13.			0.73							0.11		
14.			0.04	0.21	0.27	0.57						
15.	0.10	0.05		0.14		0.15		0.54	0.04			0.03
16.			0.06					*0.02		0.09		
17.	0.20		0.56						0.60	0.24	0.06	
18.	0.09		0.15		0.50				0.08	0.06	0.46	
19.	0.12		0.19		0.05		0.02		0.08	0.02	0.06	
20.			0.43		0.15							0.53
21.			0.32	0.34	0.07				0.02	0.15		0.06
22.		0.09	0.21	0.04	0.15	0.08		*0.12				
23.			0.07		0.15	0.37		*0.05			0.14	
24.		0.34	0.42				0.31	*0.03		0.21	0.20	
25.			0.08			0.48		0.35		0.15	0.06	
26.			0.48	0.50	*0.04	0.27		*0.02		*0.07	0.19	0.19
27.			0.08	0.04		*0.13				0.08		0.44
28.			0.16			*0.04			0.54			0.25
29.		0.15	0.05		0.11		*0.12		*0.03	0.21		
30.	0.44			0.60	0.05	*0.12	*0.02		*0.02			
31.	0.15			0.82		*0.05	*0.12		*0.04			

* Snow.

NOTE.— Data supplied by Robert E. Horton.

Daily precipitation, in inches, at DEERFIELD RESERVOIR, UTICA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.78		0.85	0.08	0.05	*0.03	0.20		0.25			
2	0.38				0.09		0.40				0.62	
3		0.04		0.57	0.07	*0.02	*0.33				0.03	
4	0.22		0.09		0.04	*0.14	*0.12			0.07		
5		0.37		0.64	0.23	*0.10	*0.06	*0.03		0.18	0.20	
6			0.97	0.06		*0.15		*0.02	*0.45		0.02	0.14
7		0.54						*0.02		0.14	0.04	0.07
8		0.23			0.02		*0.05	*0.01		0.25	0.40	
9	0.17	0.97					*0.08		*0.22	0.34	0.08	0.03
10		0.70	0.48		0.16		*0.05		*0.30	0.20	0.09	
11	0.32	0.06			0.03	*0.04			*0.15	0.0	0.81	
12	0.01		0.44			0.16				0.70	0.10	0.03
13	0.02		0.78							0.06	0.19	
14	0.11		0.03	0.36	0.07	0.42		0.20		0.07		
15	0.13			0.13		0.17		0.35	0.04			
16			0.27					*0.03				
17	0.25		0.80						0.32	0.28	0.08	
18	0.08		0.10		0.55				0.07	0.06	0.63	
19			0.33		0.06				0.03	0.03	0.07	
20			0.46		0.12							0.11
21			0.23	1.29	0.03					0.18		0.14
22		0.06	0.19		0.04	0.32		*0.05				
23			0.09		*0.04	0.53		*0.05			0.10	
24			0.38				0.44			0.22	0.10	
25			0.06			0.51	0.01	0.45		0.14	0.09	
26			0.27	0.77	*0.02	*0.30				*0.03	0.33	0.32
27			0.14	0.03		*0.02				0.04	0.04	0.92
28			0.08			*0.03			0.95			
29		0.22			0.13		*0.13					
30	0.36			0.56	0.04	*0.07	*0.01			0.19		
31	0.05			0.87		*0.03	*0.03		*0.04			

* Snow.

NOTE — Data supplied by Robert E. Horton.

Daily precipitation, in inches, at GRAEFENBURG (RESERVOIR No. 1), NEAR UTICA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.65		0.90	0.08		*0.03	0.12		0.55		0.20	
2	0.35						0.35				0.06	
3				0.55			*0.33				0.03	
4	0.25					*0.03	*0.08				0.30	
5		0.90		0.35	0.18	*0.05		0.12		0.04		
6			0.60	0.06		*0.18			*0.18			0.05
7		0.30				*0.03		*0.04		0.10		
8		0.40					*0.05			0.11	0.09	
9	0.15	0.30					*0.05			0.10		
10	0.15	0.40	0.03		0.18		*0.05		0.17			0.03
11	0.18	0.12								0.40	0.75	
12						0.06				0.52	0.10	
13			0.90							0.10	0.15	
14				0.20	0.03	0.90		0.06		0.06		
15	0.15	0.20		0.15		0.15		0.40				

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 427

Daily precipitation, in inches, at GRAEFENBURG (RESERVOIR No. 1), NEAR UTICA,
for the year ended June 30, 1919—*Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16			0.02							0.05		
17	0.15		0.40					*0.03	0.30	0.30		
18	0.18		0.15		0.50				0.07	0.05	0.50	
19			0.16		0.05				0.02			
20			0.30		0.08							0.10
21			0.45		*0.02					0.12		0.60
22		0.05	0.20		0.12			*0.10				
23					0.10	0.20		*0.08			0.12	
24		0.05	0.30			0.20	0.20			0.10	0.20	
25			0.10			0.35	0.02	0.30		0.20	0.05	
26			0.40		*0.02	0.15		*0.04		*0.08	0.30	0.15
27			0.15			*0.02				0.06		0.05
28			0.15						0.50			0.52
29		0.07			0.06	*0.10			0.10	0.12		
30	0.40				0.02	*0.05	*0.02		*0.05			
31	0.10					*0.05	*0.05		*0.02			

* Snow.

NOTE.— Data supplied by Robert E. Horton.

Daily precipitation, in inches, at GENESEE ST. BRIDGE, UTICA, for the year ended
June 30, 1919

DAY	Dec.	Jan.	Feb.	Mar.	DAY	Dec.	Jan.	Feb.	Mar.
1	*0.06	0.16		0.30	16			*0.03	0.07
2	*0.10	0.32			17				0.27
3		*0.30			18				0.05
4		*0.20			19				
5	*0.06	*0.09	0.01		20				0.05
6	*0.22		*0.03	*0.28	21				
7	*0.10		*0.02		22	0.06		*0.13	
8		*0.02			23	0.19		*0.05	
9		*0.04		*0.23	24		*0.16	0.04	
10		*0.14		*0.40	25	0.28	*0.02		
11				0.04	26	*0.06		*0.22	
12	*0.01			0.01	27	*0.05		*0.01	
13					28				*0.98
14	0.22		0.11		29		*0.12		*0.05
15	0.11		0.17		30	*0.08			*0.02
					31	*0.02	*0.06		*0.06

* Snow.

NOTE.— Station maintained by U. S. Weather Bureau in cooperation with the State Engineer.
No record for July, August, September, October, November, April, May and June.

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 429

Daily precipitation, in inches, at TRIBES HILL, for the year ended June 30, 1919—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21			0.70	0.60								0.10
22						0.30		*0.30			0.24	
23						0.90					0.32	
24							1.40				0.23	
25		0.60	0.40							*0.40	0.20	
26						0.80		0.70			1.10	0.15
27			1.80	0.78								
28												0.92
29		0.40							*1.20	0.25		
30	0.31	0.30			0.15							
31				1.12		*0.05	*0.10					

* Snow.

NOTE.— Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer

Daily precipitation, in inches, at SCOTIA, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	0.25								0.35		0.75	
2				0.18		*0.25						
3	0.06					*T	*5.00					
4		0.30			0.20		*T			0.04		
5				0.29		*5.50			0.09		0.54	
6	0.11	0.01	0.18									0.13
7										0.21		
8		0.26					*1.00					
9	0.68	0.52	0.62		0.15				0.73		0.52	0.28
10	0.15	0.49								0.39	0.58	0.43
11	0.02	0.02								0.59	0.13	
12			0.65	0.04							0.54	
13	0.03		0.07			0.47				0.07		
14	0.06	0.21				0.10		0.53				
15												1.23
16									0.83	0.63	0.11	T
17	0.54		0.17		0.32						0.24	
18	0.10		0.35		0.37				0.19		T	
19					0.16							0.08
20			0.85	0.78						0.08	0.20	
21								*3.50			0.15	
22						0.09					0.38	
23								0.32			T	
24		0.44	0.25				0.12			0.36	0.06	
25			1.29			0.40		0.41			0.33	
26			0.60	0.42		*T						0.07
27			0.08						0.72			0.33
28	0.95				0.05	*T	*T		*3.50	0.12		
29	0.05	0.69										
30		0.09		0.15	*T							
31		1.01		0.20		*T	*T		*T			

* Snow. T means trace.

WEST CANADA CREEK WATERSHED

Daily precipitation, in inches, at HOFFMEISTER, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	T				0.26		0.43				0.09	
2	T	T		0.52	0.16	*T						
3			T	T			*6.00			0.13		
4		0.08			*T	**5.00	*1.00	*T		0.17		
5			1.12	0.82		*3.00		*2.50	0.31		0.28	
6	§§1.00			T								T
7	T	0.05						**2.00		§§0.30	0.43	
8	0.17	0.60				0.06		*T		0.43		
9	0.46	T			T		**10.00		*4.00		T	0.18
10	0.03	0.34			0.61				*2.00	0.77		
11	0.22					*0.50				1.28	§§0.89	
12	0.02		0.69	T							0.23	
13	0.52		0.14	T						0.30		
14	0.43			0.35	0.63	T		*4.00				
15	T			T	*T			*T				T
16	0.40							*T	0.65	0.55	T	
17	T		§§0.72		0.22		*T		0.03			
18			0.30						0.38	0.08	§§1.61	
19					T				0.04			
20				1.24						0.08		0.38
21			§§0.85	T				*1.50			0.05	
22			0.24			0.50					0.12	
23			0.69								0.63	
24			T			0.78	§§0.95	**5.00		0.51	T	
25			T	1.00	*2.00						0.16	
26		T		T		**2.00		**8.00		*1.00	0.02	3.22
27			§§1.08			*T	*2.00	*T				T
28		0.34	T	0.06		*T	*2.00		0.83			
29	T	T			e 0.75	*3.00	*T		**3.00	*T		
30	0.62		0.20	1.71	*6.50		*T					
31		1.38				*1.00	*T		*T			

§§ Rain, including preceding day. * Snow. e Estimated. ** Snow, including preceding day. T means trace.

Daily precipitation, in inches, at HINCKLEY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	1.87		1.65			†0.37			1.10			
2					0.19		†0.58					
3				0.48			†0.28					
4			0.13				†0.30	†0.13			0.06	
5		0.13									0.26	
6			1.44	0.93								
7				0.12				†0.15		0.18		
8												
9	0.25	1.12					†0.13			0.56		0.17
10	0.90				0.42		†0.17		0.98		0.07	
11									†0.12	0.84	0.66	
12			0.48			†0.32				0.88	0.09	
13	0.57		0.91							0.12	0.17	
14	0.60		0.23	0.29		0.35		†1.68		0.07		
15	0.06					0.40						
16			0.12									
17	0.52		0.88						0.74	0.44		
18	0.47				0.75					0.04		
19			0.87		0.22							
20			0.37		0.07							0.49

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 431

Daily precipitation, in inches, at HINCKLEY, for the year ended June 30, 1919—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....			0.25							0.13		
22.....				1.74								
23.....						2.05					0.46	
24.....			0.42				0.67			0.55	0.34	
25.....						0.98		†0.55		0.15		
26.....			0.35	1.26		0.33					0.30	0.37
27.....			0.12								0.03	2.00
28.....			0.11						0.65			
29.....		0.43	0.04	0.06						0.22		
30.....	0.37	0.15			0.67		†0.10		†0.03			
31.....				0.47								

† Melted snow.

Daily precipitation, in inches, at GRAY, for the year 1912

DAY	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.18	0.03		0.54		0.01		0.15	0.08	0.13		
2.....	0.04			0.55				0.77	0.40	0.36		
3.....		0.08		0.37		0.71		1.68	0.53			0.94
4.....								0.03		0.28		
5.....	0.08			0.04		0.02	0.39	0.06		0.01		
6.....					0.46			0.03	0.84			0.66
7.....		0.04			0.21	0.24	0.04		0.21		0.59	0.05
8.....		0.13		0.70							2.01	0.02
9.....	0.10		0.19		0.01		0.21				0.12	0.02
10.....	0.01			0.19	0.12			0.12		0.17	0.03	
11.....					0.02			0.70	0.06	0.46		
12.....					0.12	0.14		0.07	0.34	0.04		0.02
13.....			0.40		0.29					0.21	0.09	0.10
14.....				0.15	0.29		0.60				0.49	0.02
15.....	0.11		0.33	0.18	0.04			0.17	0.12		0.13	
16.....	0.06		0.71	0.10		0.22	0.70		0.91	0.07		0.27
17.....					0.67	0.05						
18.....	0.11			0.16	0.22			0.24				
19.....	0.76	0.15		0.43			0.12	0.11	0.49	1.06		0.94
20.....	0.03	0.70	0.07	0.04	0.04	0.02	0.02		0.15	0.23		0.15
21.....	0.07		0.15		1.17	0.02	0.01		0.04			0.05
22.....	0.02	0.75	0.11		0.52		0.80	0.40				
23.....	0.26	0.05		0.83				0.10				
24.....	0.15	0.07	0.32	0.02				0.20	0.88	0.62		0.05
25.....	0.02		0.20	0.28				0.09	0.65	0.81	0.93	0.11
26.....		0.81							0.33	0.19	0.05	
27.....	0.08	0.84	0.11	0.20				0.47	0.09	0.08		
28.....		0.01		0.04								0.16
29.....	0.18		0.47		0.10		0.06					0.05
30.....	0.19		0.49	0.28	1.78		0.09		0.38		0.03	0.08
31.....					0.16							0.77

NOTE.—Record for this year not published heretofore; data supplied by Robert E. Horton.

Daily precipitation, in inches, at GRAY, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	1.14		1.41			0.23	0.05		0.81			
2.	0.88				0.18		0.87				0.51	
3.		0.05		0.62			0.10				0.05	
4.			0.10		0.03	0.29	0.10			0.10	0.06	
5.		0.13			0.20	0.02	0.05			0.19	0.28	
6.			1.01	0.92		0.38		0.12	0.31			
7.		0.13		0.01						0.13		
8.		0.07					0.25			0.11	0.43	
9.	0.18	1.47				0.07	0.20		0.02	0.44		0.05
10.	0.70	0.19			0.35		0.05		0.79		0.13	0.11
11.		0.09							0.12	0.67	0.72	
12.			0.30							0.73	0.04	
13.	0.24		0.61							0.12	0.21	
14.	0.07		0.13	0.10		0.27				0.13		
15.	0.14					0.04		0.95				
16.			0.25					0.05				
17.	0.28		0.67					0.02	0.55	0.40	0.52	0.90
18.	0.20		0.08		0.78		0.05		0.27		0.70	
19.			0.34		0.22				0.17			
20.			0.29		0.12							
21.			0.40	1.51	0.01					0.09	0.08	0.29
22.		0.10	0.10		0.01	0.06		0.17			0.09	
23.			0.03			1.01		0.25			0.28	
24.			0.46				0.67				0.09	
25.			0.02			0.83	0.01			0.40	0.26	
26.			0.62	0.96		0.27		0.91			0.27	0.39
27.			0.33			0.02		0.05				1.37
28.			0.04						0.97			
29.		0.40	0.05		0.45		0.12		0.04	0.38		
30.	0.31			0.66	0.07	0.02			0.02			
31.	0.19			1.06								

NOTE.—Data supplied by Robert E. Horton.

Daily precipitation, in inches, at TRENTON FALLS, for the year ended June 30, 1919

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	1.04		1.27				0.25		0.54			
2.	0.30			0.57		*0.28	0.25				0.84	
3.		0.09		0.02			*0.35					
4.			0.04			*0.28	*0.32			0.06		
5.		0.19	0.50		0.04	*0.09	0.04	0.04		0.08	0.10	
6.			0.48	0.80		*0.29		0.02	0.30			
7.		0.25		0.15				0.07		0.18	0.46	0.08
8.		0.50					*0.30			0.10		
9.	0.65	1.02				0.07	*0.10		0.40	0.38	0.32	0.20
10.	0.25	0.32			0.27		0.05		*0.25			
11.	0.15				0.11	0.02			*0.15	0.68	0.42	
12.			0.55			*0.27			0.15	0.82	0.20	
13.			0.80							0.10	0.28	
14.	0.23		0.15	0.42	0.09	0.25		0.34		0.05		
15.	0.32			0.65		0.35		0.45				
16.			0.38									
17.			0.75					0.03	0.45	0.38	0.83	0.08
18.	0.33		0.40		0.68				0.40	0.06	0.38	
19.			0.35		0.15						0.16	
20.			0.52		0.03							

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 433

Daily precipitation, in inches, at TRENTON FALLS, for the year ended June 30, 1919

— Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21			0.05	1.17	0.03					0.18	0.10	0.26
22			0.13		0.07	0.20		0.10			0.09	
23						1.43		*0.11			0.08	
24			0.18		0.02		0.55	0.05		0.10	0.32	
25			0.10			0.73				0.51	0.39	
26			0.18	1.02	*0.07	0.25		0.53		*0.03	0.20	0.48
27			0.17	0.10	0.05	0.05				0.07	0.18	1.77
28			0.05			0.05	0.03		0.95			
29	0.06	0.43	0.07		0.70		0.07		0.04	0.25		
30	0.11			0.60	0.06	*0.05						
31	0.11			0.80		0.05	0.04		0.07			

* Snow.

NOTE.— Station maintained by U. S. Weather Bureau in coöperation with the State Engineer.

CATSKILL WATERSHEDS

Stations maintained by the Board of Water Supply of New York city.

Monthly rainfall, in inches, on CATSKILL WATERSHEDS, for the year ended June 30, 1919

STATION	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
ESOPUS CREEK												
Phoenicia	3.18	2.06	7.32	2.57	1.81	3.34	1.97	2.31	6.65	3.16	6.84	4.33
Slide Mountain	3.79	2.03	7.68	4.27	1.91	3.93	3.81	2.49	6.96	4.03	5.56	4.68
Highmount	3.07	2.80	6.82	3.43	1.22	2.37	1.91	1.73	4.54	3.07	4.03	2.63
Edgewood	4.45	2.36	8.95	2.80	2.41	2.66	1.64	3.34	5.85	3.13	6.70	6.30
Lake Hill	2.98	3.05	8.91	2.06	2.24	3.84	1.91	2.21	7.51	3.24	5.16	4.78
Kingston	3.20	2.42	6.52	2.27	2.76	3.44	2.15	1.97	4.57	2.74	5.05	1.76
West Hurley	3.35	1.98	7.35	1.61	2.80	3.36	1.81	2.59	4.99	3.04	5.88	3.29
Brown Station	3.16	1.77	7.06	1.99	2.41	3.90	2.25	2.59	5.19	2.97	5.77	5.89
West Shokan †	2.80	2.10	9.25	2.84	2.36	4.76	2.51	2.85	5.25	2.96	6.80	4.26
Zena	3.44	2.12	7.24	1.16	3.44	3.49	2.01	2.64	5.54	3.18	6.44	2.65
Coldbrook	2.58	2.76	9.52	2.34	2.39	4.14	2.12	2.46	6.03	3.10	6.26	4.01
Big Indian	3.00	2.59	6.81	3.41	1.21	2.97	2.51	2.23	4.84	3.15	4.97	4.72
RONDOUT CREEK												
Grahamsville	4.00	2.74	8.16	3.51	1.92	4.40	2.73	2.39	4.43	2.94	4.14	2.86
Sundown	3.06	3.18	7.86	3.62	1.89	5.32	2.78	2.79	4.82	2.68	4.94	3.68
Peekamoose	4.08	2.90	10.07	3.54	1.92	5.84	3.42	2.21	5.75	3.50	6.42	4.98
Lackawack	2.32	2.01	6.63	2.50	1.65	3.33	2.28	2.16	5.40	3.50	4.93	3.56
Rosendale	1.70	2.06	6.26	2.06	2.85	3.75	2.37	*				
SCHOKARIE CREEK												
Windham	3.33	2.63	5.46	2.32	0.97	1.80	1.36	1.21	3.66	2.66	4.54	3.40
Elks Park	4.15	3.04	10.20	3.14	2.92	5.85	2.72	2.68	7.70	4.20	7.75	7.02
Lexington	2.60	1.54	6.17	2.20	0.82	2.11	1.66	1.12	3.92	3.03	4.46	4.48
Prattville	1.42	2.27	5.19	2.60	0.72	2.44	2.28	1.32	3.32	2.76	4.53	4.07
Grand Gorge	1.80	2.69	4.88	2.76	0.92	2.00	1.94	1.36	2.82	2.78	3.84	4.09
Stamford	2.68	3.11	5.46	3.40	1.10	2.10	2.09	1.44	4.02	3.07	3.98	3.63
Manorkill	3.32	2.96	4.40	2.13	1.47	1.88	2.26	1.32	3.64	2.68	3.94	4.94
Esperance	2.21	3.80	4.86	1.52	1.02	2.08	1.42	1.28	3.40	1.56	3.51	2.44
Gilboa	1.70	3.47	5.02	2.19	0.72	1.78	1.49	1.30	3.09	2.72	3.84	3.22
CATSKILL CREEK												
Preston Hollow	2.97	3.29	5.33	2.05	1.32	2.02	1.40	1.02	2.92	1.92	4.69	3.51
Oak Hill	2.85	2.50	4.85	1.64	0.89	2.34	1.66	1.24	3.30	2.50	4.64	3.70
Westerlo	1.22	2.77	5.10	2.11	1.10	1.50	1.34	1.27	2.36	3.28	5.76	4.57

* Discontinued January 31.

† Gage relocated at West Shokan, April 13, 1918.

REPORT OF STATE ENGINEER

Mean monthly rainfall, in inches, on CATSKILL WATERSHEDS

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for year
ESOPUS CREEK — ABOVE OLIVE BRIDGE DAM													
1906	2.85	2.26	4.80	3.85	5.01	6.16	4.42	3.76	3.18	5.47	2.26	4.08	48.10
1907	2.59	1.66	1.20	2.17	3.83	3.45	3.13	1.17	11.49	6.78	7.06	5.80	50.33
1908	3.49	6.40	2.93	2.98	9.23	2.29	6.32	2.04	2.46	4.21	0.57	2.58	45.50
1909	4.82	6.97	4.35	5.20	4.48	4.38	2.06	4.83	4.17	1.40	1.98	4.63	49.27
1910	7.61	4.37	0.93	10.18	2.95	4.59	2.02	3.93	5.21	1.02	3.70	2.30	48.81
1911	2.60	1.94	3.90	2.37	1.06	5.04	3.19	4.83	4.25	7.50	3.50	2.91	43.99
1912	2.38	2.96	5.96	5.76	4.36	1.72	3.25	7.47	3.44	4.84	4.08	4.70	50.92
1913	4.26	2.28	7.70	3.81	3.74	1.01	1.90	4.86	4.02	6.76	5.60	2.93	48.87
1914	3.40	2.44	4.02	5.94	2.99	3.18	3.49	3.91	0.56	2.97	3.32	3.69	39.91
1915	6.85	5.32	0.21	2.16	2.27	2.96	8.59	8.93	2.99	2.48	3.90	5.86	52.52
1916	1.64	4.48	3.23	2.63	3.35	5.33	8.14	1.96	4.23	3.15	4.37	2.98	45.49
1917	4.14	2.15	3.53	2.47	4.27	6.72	4.04	6.58	1.09	7.70	1.08	2.45	46.22
1918	3.49	2.65	2.75	4.22	4.62	3.29	3.35	2.33	7.90	2.59	2.20	3.52	42.91
Mean	3.86	3.53	3.50	4.13	4.01	3.92	4.15	4.35	4.23	4.37	3.36	3.73	47.14

RONDOUT CREEK — ABOVE HONK FALLS AND LACKAWACK													
1906	2.69	2.64	3.91	4.54	4.34	5.23	5.51	4.47	3.87	4.40	2.15	4.20	47.95
1907	3.43	1.93	1.93	2.19	3.68	3.69	2.95	1.88	9.42	5.50	6.32	5.03	47.95
1908	3.12	6.24	3.53	4.02	7.64	1.75	5.08	2.59	2.64	3.74	0.72	3.09	44.16
1909	4.82	6.61	3.99	4.71	3.36	4.39	2.07	4.46	3.54	1.25	1.86	4.47	45.53
1910	7.07	4.53	1.03	8.30	3.60	4.22	2.34	4.08	5.25	1.18	3.36	2.25	47.21
1911	3.44	1.99	4.42	3.11	1.16	6.57	3.27	5.14	4.17	7.10	3.43	3.08	46.88
1912	2.24	2.41	5.86	5.77	3.59	1.91	2.82	7.32	3.79	3.92	3.02	4.78	47.43
1913	5.05	2.61	7.65	4.67	3.46	1.44	3.38	6.04	4.20	6.53	4.74	2.72	52.49
1914	3.33	2.13	3.57	4.91	2.98	4.28	4.06	4.14	0.71	2.64	2.74	3.82	39.31
1915	6.63	5.41	0.33	2.33	3.00	3.45	9.83	7.17	3.03	2.57	3.40	6.11	53.26
1916	2.35	4.87	3.84	3.64	3.71	5.76	9.08	2.19	5.31	3.25	3.95	3.61	51.56
1917	4.04	2.76	3.92	2.15	3.32	6.76	5.51	8.05	1.31	7.10	1.48	2.25	48.65
1918	3.76	3.79	2.72	4.39	3.26	3.71	3.40	2.71	8.18	3.29	1.84	4.72	46.77
Mean	4.00	3.69	3.59	4.21	3.62	4.09	4.56	4.63	4.26	4.04	3.00	3.86	47.55

SCHOHARIE CREEK — ABOVE PRATTSVILLE													
1907	2.05	1.54	1.04	2.33	3.46	3.27	3.28	0.76	8.29	5.51	6.08	1.66	42.27
1908	2.93	5.51	2.31	2.68	7.53	2.22	4.36	2.32	2.82	4.31	0.44	2.01	39.44
1909	4.12	4.82	3.38	4.47	4.24	4.19	1.53	3.23	3.17	1.35	1.85	4.14	40.49
1910	6.67	3.42	0.62	7.76	3.07	5.03	1.54	2.23	4.22	0.80	4.94	1.45	41.75
1911	1.85	1.13	2.13	1.43	1.43	6.09	2.06	4.16	3.21	4.68	1.99	1.79	31.95
1912	1.66	2.14	4.06	4.88	3.64	1.52	2.60	3.84	3.48	3.31	3.14	2.86	37.13
1913	2.78	2.00	5.24	3.22	3.05	1.58	1.46	3.56	3.16	5.34	5.59	1.94	38.92
1914	2.28	2.28	4.50	5.22	3.27	2.96	4.22	4.71	0.87	1.93	2.72	2.62	37.58
1915	4.18	4.09	0.22	2.21	2.19	2.34	8.01	7.50	3.77	2.32	2.53	5.54	44.90
1916	1.06	4.31	2.81	2.66	2.82	4.02	6.44	4.72	4.22	2.11	3.13	2.12	40.42
1917	3.11	1.30	2.62	1.71	4.04	5.63	2.61	6.03	1.15	8.25	0.88	2.28	39.61
1918	3.19	2.03	2.55	4.34	5.02	3.14	2.88	2.37	6.76	2.56	1.36	3.05	39.25
Mean	2.99	2.88	2.62	3.58	3.65	3.50	3.42	3.79	3.76	3.54	2.89	2.87	39.48

Note for Esopus creek. — January, 1906, to November, 1906, inclusive, average of 6 stations. December, 1906, average of 7 stations. January, 1907, to June, 1907, inclusive, average of 8 stations. July, 1907, and August, 1907, average of 11 stations. September, 1907, to December, 1909, inclusive, average of 12 stations. January, 1910, average of 11 stations. February, 1910, and March, 1910, average of 12 stations. April, 1910, to January, 1915, inclusive, average of 10 stations. February, 1915, and March, 1915, average of 11 stations. April, 1915, average of 10 stations. May, 1915, to October, 1915, inclusive, average of 11 stations. November, 1915, and December, 1915, average of 12 stations. January, 1916, to March, 1916, inclusive, average of 13 stations. April, 1916, average of 12 stations. May, 1916, to November, 1916, inclusive, average of 13 stations. December, 1916, to February, 1917, inclusive, average of 12 stations. March, 1917, to December, 1917, inclusive, average of 11 stations. January, 1918, and February, 1918, average of 9 stations. March, 1918, and April, 1918, average of 10 stations. May, 1918, to December, 1918, inclusive, average of 11 stations.

Note for Rondout creek. — January, 1906, to December, 1906, inclusive, average of 4 stations. January, 1907, to March, 1910, inclusive, average of 6 stations. April, 1910, to December, 1917, inclusive, average of 5 stations. January, 1918, to December, 1918, inclusive, average of 4 stations.

Note for Schoharie creek. — January, 1907, to June, 1907, inclusive, average of 6 stations. July, 1907, to December, 1907, inclusive, average of 7 stations. January, 1908, to March, 1910, inclusive, average of 5 stations. April, 1910, to April, 1917, inclusive, average of 4 stations. May and June, 1917, average of 5 stations. July and August, 1917, average of 6 stations. September and October, 1917, average of 7 stations. November and December, 1917, average of 8 stations. January, 1918, to December, 1918, inclusive, average of 4 stations.

CLIMATOLOGICAL DATA: PRECIPITATION RECORDS 435

Mean monthly rainfall, in inches, on CATSKILL WATERSHEDS—Continued

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for year
CATSKILL CREEK—ABOVE OAK HILL													
1907.....	1.92	1.28	1.16	2.38	3.25	3.15	3.31	0.85	6.58	4.18	4.91	3.52	36.49
1908.....	2.43	4.01	1.83	2.15	5.86	1.58	4.00	3.01	1.59	3.35	0.39	1.57	31.77
1909.....	3.56	3.76	2.79	3.00	3.92	3.52	2.36	2.47	2.74	0.96	1.50	3.59	34.17
1910.....	4.67	3.02	0.48	5.70	2.04	4.82	1.21	1.55	4.07	0.91	3.57	0.92	33.86
1911.....	1.32	1.13	2.07	1.55	1.41	7.06	2.20	3.38	2.94	4.32	1.45	1.87	30.70
1912.....	1.71	2.12	3.50	4.50	3.36	1.08	2.63	3.80	3.27	3.66	2.78	2.37	34.98
1913.....	2.66	1.87	4.60	3.05	3.18	2.16	1.83	1.37	2.67	4.89	4.73	1.83	34.84
1914.....	2.10	2.14	4.78	5.32	3.26	2.50	3.97	4.18	0.64	1.53	2.49	2.43	35.34
1915.....	3.40	3.31	0.09	2.03	1.91	2.60	6.93	7.20	2.78	2.22	2.60	5.66	40.73
1916.....	1.09	4.01	3.28	3.56	2.88	3.22	4.42	3.70	3.67	1.82	2.76	2.11	36.52
1917.....	1.76	1.46	2.49	2.07	4.12	4.01	1.49	5.65	1.08	7.38	0.81	2.22	34.54
1918.....	2.57	1.14	2.42	3.75	4.02	2.39	2.74	2.83	5.03	2.05	1.15	1.91	32.00
Mean.....	2.43	2.44	2.46	3.26	3.34	3.17	3.09	3.33	3.09	3.12	2.43	2.50	34.66

Note for Catskill creek.—January, 1907, to December, 1907, inclusive, average of 6 stations. January, 1908, to August, 1917, inclusive, average of 5 stations. September, 1917, to December, 1917, inclusive, average of 6 stations. January, 1918, to December, 1918, inclusive, average of 5 stations.

WATER SHEDS AT LARGE

Stations maintained by the Board of Water Supply of New York city.

Monthly rainfall, in inches, on various watersheds, for the year ended June 30, 1919

STATION	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
PEEKSKILL CREEK												
Peekskill.....	4.98	2.61	4.55	1.20	2.57	3.70	.....	.....	.....	.....	.....	.....
Nelsonville.....	4.18	2.38	5.81	1.96	2.55	4.33	.....	.....	.....	.....	.....	.....
WALKILL RIVER												
Walkill Blow-off.....	3.04	2.10	5.91	1.77	2.98	4.00	2.50	2.40	4.81	3.71	5.96	2.89
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* Discontinued.

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